Vol. XVIII New York—Thursday, February 6, 1908—Chicago No. 6

THE AUTOMOBILE

Autoing Through the Island of Sugar and Tobacco

HAVANA, Cuba, Feb. 1.—Silhouetted against a dark, clear sky like stately sentries, a hundred palm trees framed such a picture as inland Cuba has never seen. Close by a trickling stream at the bottom of a stony valley, a huge flaring fire of palm leaves cast theatrical lights on a quintet that was viewed with much wonder by two Cubans on horseback and a barefooted native who stood in awed silence before the group. In the deep gloom under a cluster of palms stood the big black thing in which they had come—an automobile. It was wonderful. Automobiles they knew the great Americanos had to skip over country where there were roads. Here there was no road. This route through the hills was but a path for horses and that rock-strewn ascent—surely the big automobile could not go up such a hill. The Americans laughed and asked about the country and its trails. The dark-visaged doctor and his servant answered in that rapid fire of Spanish which makes a Cuban conversation like the popping of a Hotchkiss. But neither the exuberant Spanish tongue, nor the skillful interpreter was able to express the full measure of Cuba's surprise at such a vehicle in such a country.

It was the adventurers' first night under the star-brilliant skies of Cuba. That afternoon they had gayly skipped out of Havana, leaving behind a wholesale stock of pessimistic warnings. At garage, hotel, store, restaurant—every Cuban and every American had said: "Impossible; it can't be done. Why, there are no roads at all in the interior. You will not get twenty-five miles away from Havana. You had better stick to the delightful speeding on the San Cristobal road, like the orthodox tourists who yearly come here."

Perhaps the wide and glorious fame of the San Cristobal road had brought these Americans southward via the False Impression Air Line. But now that they were here, they would go into the back yard of Cuba whether or no, roads or no roads. Thus when the first day's sun sank behind a palm-fringed screen and, without even a twilight overture, the whole big night filled the stage four Americans and a leased Spanish Voice gnawed hungrily at the Cuban-cooked guinea hen which had been bought of the barefooted farmer, while they talked with the strange doctor who rode abroad at night in a wide, wild country.

"Is this the road for Matanzas?" queried an American.

"Este es el camino para Matanzas?" echoed the interpreter. And the answer started with "Si, Señor," but ended with something that sounded like a nickel-in-the-slot piano and meant that it was about 45 leagues to Matanzas; that we could have gone another way; that the road was nothing but a series of stone-stepped hills and ragged ravines; that the next town, about a league and a half away, was called Jaruco; why had we ventured such a hazardous and altogether impossible journey; who were we, and from where did we come?

GETTING ROAD DIRECTIONS FROM TYPICAL CUBAN FARM FOLK

To the best of our knowledge the conversa-

tional transfer told the attentive audience that we hailed from Detroit; that the longest one, with the khaki suit, was S. D. Waldon, sales manager of the Packard Motor Car Co.; the other being Senors George, Crebbin, and Estep; that the automobile was a Packard, and that we intended to stay a week or more touring in the interior of Cuba. At least he talked enough to have told all this and then a little.

Thirty Miles the First Day.

That first day we had made thirty miles between 2 o'clock, when we pulled away from the Pasaje Hotel, and when darkness caught us at the spot we named Camp Jaruco because it had never been properly christened. It had been a hard afternoon's drive, and in a degree the evil forebodings of the Havana skeptics had been realized.

We left Havana down an aisle of palms, floored with velvet macadam and sentineled with an occasional block house which added romance to the picture of low huts dotting the rolling hills. The macadam terminated soon in a stretch of freshly graded but uneven road where a new state highway is being built. This gradually went from bad to worse until it reached the ordinary and typical Cuban trail which has never felt a roadmaker's hand. Six or seven leagues out of Havana we seemed to be in the midst of an elementary country and it was easy to imagine all manner of hardship as companion woes to the steep hills and rough ditch-like trails that formed the only route we could find. We discovered that the rough fields were often better than the trail. So we climbed a couple of hills over plowed ground and then all but jumped down a near precipice to Camp Jaruco. There was little sleep that night. We made a bed of palm leaves and brush on the ground, but it was not a good bed. The night proved chilly. We tried all places and positions, and then, in the main, devoted the silent, rather awe-inspiring hours to gathering palm bark and other fuel for the fire.

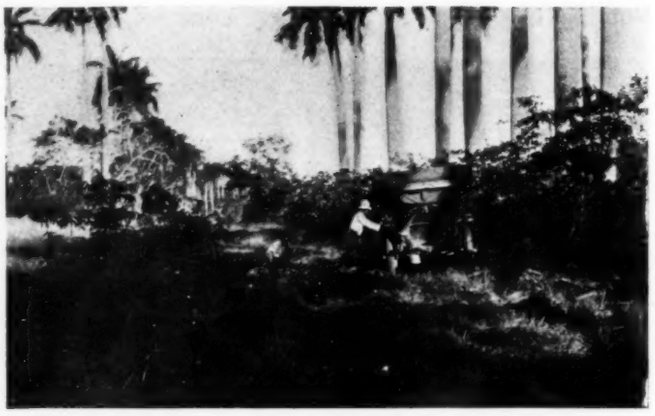
We commenced the second day on a frugal breakfast of tea and crackers and a hill-climb through a field to a peak where a farmer had a hut which overlooked so much of Cuba that we shut our eyes to the prospect. It was on this day that we began learning Cuba in earnest. We met strange things at close range. After having toiled laboriously and precariously over some rocky ridge or crept along a ravine where the one wheel would have to bump from rock to rock and the other follow a sloping ledge, we would strike a brand new fantastic setting, laugh at its quaint and innocent actors, blush at its deshabille, kill a scorpion or two, go splash, dash through a minor ford, or stop for a moment at some hut with the inevitable:

"Oiga, chico! Este es el camino?"

We lunched at Jaruco with the whole town as audience, which retired with a yell to box seats in their respective windows when we started the motor and rushed on. For an eighth of a mile we "beat it," and remembered the Glidden tour. Then we pitched off into the middle of Cuba and for the afternoon were again lost in a land of beautiful flowers and majestic trees; red clay soil which has been out deep with the long-worn ruts of giant ox carts; ruins that seem yet to smolder with the fire that Weyler lighted; stones which carpet the earth so thickly that the only way around them is over them. Once the road dropped into a trough in the red earth. Just wide enough to let us through, it was like riding down some winding flume, not knowing whither, because the grass on the banks reached high above us. Often we found the only passage to be along the wriggling fences, and with hatchet and machete we cut down the underbrush to clear a trail we could follow.

Cuba's Roads Are Varied and Doubtful.

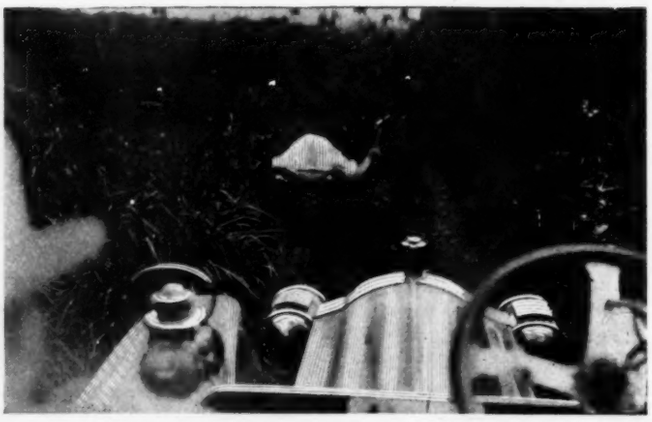
There is no continuation of any kind of road in a day's travel through Cuba. The face of the country changes rapidly and the character of the route in still greater proportion. There are no four-wheeled vehicles of any kind. We were



REPAIRING A PUNCTURE ON SANTA CLARA TRAIL

PACKARD CLIMBING HILL IN HAVANA PROVINCE

TYPICAL FORD IN SANTA CLARA PROVINCE.



TAKING A HACK AT THE ROAD AHEAD.

in a land where the only hauling is by ox carts whose wheels are from seven to ten feet high and which are dragged by from three to five yoke of thick-shouldered, powerful oxen and bulls. The clearance of these carts is always more than forty inches. When the ground is soft they simply plow it into straggling furrows from two to four feet deep. The only other travel is by horse. Water, food, vegetables, fruits—everything except the sugar cane and the logs goes about on the backs of ponies or pack mules.

IN THE SPOT LIGHT AT JARUCO, BEING EXAMINED BY THE CURIOUS.

A comparatively level path across the red soil may, in a quarter of a mile, abruptly end in a valley which is nothing but a mass of huge boulders; it may lead to a score of mud holes or to a long stretch where the ruts have been cut so deep and so numerously that they will never be erased and where there is only one course—to jump around on the ridges in a car-straining, nerve-racking, wheel-twisting, tire-abusing effort to avoid dropping into any of them. Then, again, a few miles will bring you to a country where the road is marked by long rows of palms set by early Spaniards but between which there is nothing except an endless river of rank grass, hiding stones, stones, stones.

That second day we began to get into the region of rivers and went through a rehearsal of the great continuous show of succeeding days, the act of wading into a river to find out where might be a safe path for fording it. We were glad to end the day, with 34 miles gained, at a farm-house hut with a few square feet of grocery store in one corner. We ate the typical country meal, garlic-flavored, greasy and made up of eggs, chicken and rice, tomatoes, fried potatoes, and bread. We added tea. Coffee in Cuba is "solo," which means so black that one must be in good training to drink it; or "con leche," which means about half-and-half with warm Cuban milk, which is not the kind of milk a foreigner is used to. We slept on cots in a well-ventilated corner of the house—at least we stayed on the cots, while we listened to queer night noises, fought fleas and discussed this peculiar "land of Manana," where nothing is done to-day and where a lot of things that ought to be done probably never will be done.

Where There Was No Bridge.

At daylight we swallowed some coffee and struck off on the nine-mile stretch to Matanzas. We met a section of State road in process of construction, and mounted its rough stone but level surface only to reach, in a few hundred yards, a wide chasm where the bridge had not yet been built and the river flowed between banks a hundred feet deep. This is a bad habit of Cuban rivers. They can be forded by carefully selecting a course over ridges in the solid rock which forms their bed. It is a harder task to reach them. The only way down the precipitous bank is through some ravine or washout. This invariably is a crooked path of rock with steep drops and actual steps three and four feet high. Sometimes a crooked, lengthwise rut, worn by years of horse travel and by ox carts which have been hauled up the path, made it necessary to run the car down with the wheels on the almost vertical walls of the rut. Often we were forced to take the mattock and cut a slender shelf for several yards along such a wall, in order to give the car even the slightest footing. Once at the bottom, there is the strip-and-wade-into-the-river act to determine the proper place to cross; the ford itself, with a rubber coat over the radiator to keep water out of the bonnet, and then the climb up a ravine that matches the one by which the descent was made.

We stopped a few hours in Matanzas to buy some groceries, search for gasoline and add to our supply of road-making implements. We also changed interpreters, and this time got one Geerken, clerk of the Hotel Paris, whom we called Roe and who turned out to be not only capable and willing but comedian enough to help turn many a deep mud hole or turbulent river into a joke.

Eastward the Star of Hope took its way in a Packard car, over a new good road which stopped after nine miles so

ENTERING A FARMYARD, WHICH MEANT SUPPER AND A PLACE TO SLEEP.

CENTRAL CUBA ABOUNDS WITH GAME.

"QUE HAY DE NUEVO, SEÑORITA!"

suddenly in a natural stone quarry that we once more adopted across-lot tactics. A river which had been described as fifteen feet deep turned out to be almost dry and we hardly missed the bridge which had once been there but which the Spanish army had destroyed while industriously engaged in keeping a big bunch of machete slingers from following. Towns were thick along here, and we much enjoyed coming out of a hard fight against ruts and stones into a level area where from the collection of houses there invariably streamed a horde of young and grown-up children whose eyes popped out, whose tongues could hardly answer our "Que hay!" and whose feet finally pattered rapidly on the stone as they chased us up the road to prolong the final view of this new American invasion. We had a lot of trouble convincing the natives that we did not belong to the United States army. What else but that great, all-powerful United States army could have such a vehicle wherewith to travel over such trails as those of Cuba? Our day netted 44 miles, which was pretty good considering our four-hour wait in Matanzas. We ate under the flickering flame of an acetylene lamp in the main room of a farmhouse called Tosca. In rural Cuba the poor use candles or simple kerosene lamps, but the more pretentious have acetylene, manufactured in a small generator kept outside the house.

Into Heart of Sugar Cane Region.

Now we were getting into the heart of the sugar cane region and our fourth day earned us 60 miles, some of the going being pretty good. Ruts we encountered by the mile for there was much hauling of sugar cane hereabouts. Also more stones and rivers and those long stretches where there is no road, and we simply picked a way to our taste across the stone-strewn, grass-covered hills and flat lands. Everywhere ruins to remind of the war, and in the towns "Vive la libre Cuba" signs calcimined on the sides of the houses. The fighting had evidently been the real thing in this neighborhood. In fact the rural guard who sold us a machete said he had killed seven Spaniards with it.

We stopped at an immense sugar mill to get a glimpse of its inner workings, and a drink of water which was brought to us in a "porron." This is a bottle which you must not touch with your lips but must hold several inches away and try to hit your mouth with the stream of water.

Macagua was an interesting night rest. The whole countryside had come to town, for it was Sunday and there had been a ball game between local teams; also there was a dance in the hotel office that evening and we attended this in full dress—flannel shirts, khaki knee trousers, leggins, mud and four days' growth of beard. It was not much fun, so we went outside and showed a lot of fussing, jabbering town celebrities how to send up a big colored paper balloon.

Into Hillier and Wilder Country.

For five more days we went on into the hillier and wilder country. Monday was our record day—63 miles. Most of these were made through an immense flat country which was either swamp, out of which grew grass higher than the car and which hid wet and hard ground and stones alike, or it was a high plateau, where there was not a thing in sight but royal palms, scattered clumps of shrubbery and ponds. Here the surface was fairly hard, although to a northern road-trained eye it would have looked rough and arduous of travel. We got over it fairly well until we lost our way and only found populated country by cutting to the railway track, which we knew to be to the south of us, and then by following along its right of way to the next town. Some time when you are riding on a train, look for a place where the right

(Continued on page 192)

AMERICAN NATIONAL GAME IN CENTRAL CUBA.

JAI ALAI—THE CUBAN NATIONAL GAME

TOURING IN TENNESSEE, ALABAMA, AND GEORGIA

By PATHFINDER.

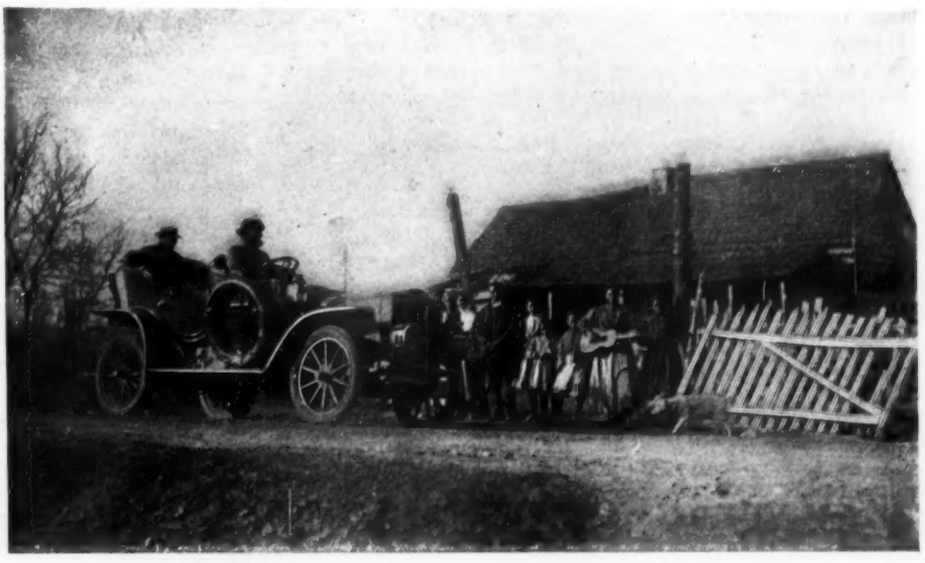
ONCE leaving Nashville, the route which we have followed in our White steamer is practically the same as that taken by the armies during the Civil War as the Union forces slowly but surely advanced into the territory of the Confederacy and swept the Southern troops before them. This is not a coincidence, for I deliberately planned our route after consulting the Civil War histories. There are no road maps covering this section of the country, and I could think of no better way of finding out the lines of least natural resistance, and, therefore, the probable location of the best roads, than to search into the records of the war.

Before leaving Nashville, we visited several points of interest about the city, including the tomb of President Polk and the famous "Hermitage," the old home of Andrew Jackson. The latter is located about twelve miles from the city on what is known as the Lebanon Pike. The afternoon was half over when we finally started on our way and we had an easy three hours' ride through Murfreesboro to Shelbyville (57 miles from Nashville), where we spent the night. Nashville is in Davidson County, and the roads in that county are free, but thereafter there were toll gates at frequent intervals, and we paid all told $1.95 between Nashville and the Alabama boundary.

A PAUSE ON THE SUMMIT OF ORCHARD KNOB NEAR CHATTANOOGA.

At Murfreesboro we saw what is left of the fortifications which were erected at the time of the famous two-day battle, and at Shelbyville were other sights to revive war memories, as it was here that the Confederate army spent the winter after their defeat at Murfreesboro.

At Shelbyville we could have turned southeastward and made Chattanooga in probably one day's ride, but I preferred to go southward into Alabama, following the lines of the military operations. The toll road continued south from Shelbyville through Fayetteville and almost to the State line. And here I would like to offer a word of warning to those tourists who may follow this route. The toll gates are kept down and are not raised until the toll has been paid. This procedure is all very well—provided you see the gate. We were bowling along toward Fayetteville at a good rate of speed when suddenly we saw a toll gate blocking the road only a few yards in front of us. I jammed on the brakes with every ounce of strength I could muster and brought my car to rest with scarcely a foot to spare. The gate was an unpainted affair of almost the same color as the road, and it is no wonder that none of us saw it until we were right upon it. I remonstrated angrily with the gate keeper. "It is the orders to keep the gate down," he explained. "But surely you hang a lantern at night?" I asked. "No sir," he replied, "never had any order to do so." It was then that I began to realize a general truth which was more and more impressed upon me as we advanced, namely, that in this section of the country, as regards the maintenance and condition of the highways, the traveling of motor cars over them has not received any consideration whatever. The conditions are adapted to horse-drawn vehicles—and that is all.



GEORGIA PICKANINNIES GROUPED ABOUT THE WHITE STEAMER.

A Century from Nashville to Alabama Line.

It is almost exactly 100 miles from Nashville to the Alabama line. This section is distinctly Southern. The "Soldiers' Monument" in each town is invariably a Confederate memorial. On this part of our journey we had our first glimpse of the cotton fields and realized we had arrived in Dixie.

ALABAMA COTTON GIN WITH WATER POWER.

From the State line we had 18 miles of fair road to Huntsville, Ala. Here we turned east and soon had the pleasant sensation of crossing two considerable ridges on a road without water breaks. After leaving the town of Gurlie, we crossed what could fairly be called a mountain, for the first time since leaving Pennsylvania. The road over the mountain was only partially completed and was so mushy that we used almost as much power going down as we had going up. What was our surprise, therefore, to turn from this road abruptly into a stretch of perfect macadam. We had come into Jackson County, Ala., and soon we learned not to be surprised at anything within its borders. Never have I seen such contrasts between good roads and bad roads as we saw in Jackson County. Possibly 75 per cent. of the going was over fine pikes and the other 25 per cent. was over roads which are apparently absolutely neglected.

We spent that night at Woodville, a little hamlet 150 miles from Nashville, having covered 93 miles for the day. There was more rain that night and the next day we struck many soft places where the only thing to do was to get brush and stone to put in the path of the wheels. Interspersed with roads of this kind were occasional stretches of fine pike, with here and there a road made up mostly of loose stone where we found that we needed every bit of the unusually liberal clearance which distinguishes the White steamer. The distance covered that day, to our night stopping place at Bridgeport, amounted to only 58 miles; from which it is evident that Jackson County, Ala., is not an ideal touring section at this time of year. We were told, however, that in summer the roads are in very good condition.

Leaving Bridgeport the next morning we had very good roads to Jasper, and here we found the person we had been seeking for two days, namely, an individual who was able to tell us how to get into Chattanooga. Here let me point out that we have had the hardest time in getting road information ever since leaving Nashville. At that city even John T. Landis, who has driven his car from Nashville to Quebec, confessed that he had never been to Chattanooga and he did not know of any one who had. When such a veteran tourist could give us no information, imagine how much we could learn from the farmers along the road. Please keep in mind that Chattanooga is not an easy place to reach by automobile. Nature seemed to have tried to shut off Chattanooga from the outside world and Man has done but little to thwart her purpose—at least from the autoist's point of view. Chattanooga is located in a little valley from which mountains rise on every side. As if this was not sufficient isolation the Tennessee River twists and bends about the city, seeming to press it back against the mountains. Therefore, two problems had been before us ever since leaving Nashville, where we could cross the mountains and where we could cross the river. Our historical guides failed us completely, as the army had, at will, taken to the railroad right of way or had been carried on the river in boats. We were, therefore, highly pleased when we chanced to meet at Jasper a gentleman who owns a White car and who gave us the desired information.

FORDING THE SHALLOW SEQUATCHIE RIVER.

Acting in accordance with his directions, we turned toward the Tennessee River and headed for Rankin's Ferry. Here we were taken across in a flat-bottom boat, propelled by oars, and, on the other side, we had a fine little job of road building to make our way up the muddy incline which, but two days before, had been part of the river bottom. What good did it do for us to suggest to the ferryman that he dump a little stone into this quagmire? As I said before, the peculiar necessities of the automobile have not entered into the calculations of the people in this section.

From the ferry we had seven miles of rather rough going, crossing in the meantime Raccoon Mountain. On our way up the mountain we several times forded a mountain stream and the fording places looked as if they might be deep at certain seasons. On the far side of the mountain we struck a good pike, which led us into Chattanooga, 247 miles from Nashville by our indirect route.

Before reaching the city this pike leads along the side of Lookout Mountain. If one should slip over the side of the road he would land in the Tennessee River, several hundred feet below. If it were not for this feature I might venture to suggest Lookout Mountain as a suitable place for a great hill climb. We arrived in Chattanooga in time for lunch and had a half day in which to look over the city. The next morning we resumed our journey southward. A boulevard leads from the center of the city to Missionary Ridge, where commences a fine stretch of government road.

From Lafayette and on through Summerville we found the road fair to poor. The soil is composed of reddish clay and sand which washes out freely and leaves the road full of ruts and holes. Yet we had good solid ground under our wheels and made good progress to Rome, 75 miles from Atlanta, and here spent the night.

The next day it rained continuously, and we had an opportunity to see what a fine slippery mixture the Georgia clay can make. Although it was hard work keeping the car in the center of the road, we found that there was considerable bottom to the road.

The 400 miles between Nashville and Atlanta have been by far the worst we have yet covered. The heaviness of the road, however, has been due entirely to the abnormally heavy rains, and I have no reason to believe that the tourist who has made his way as far as Nashville will find the journey from there to Atlanta particularly severe at a more propitious time of the year.

SEVENTEEN MILES OUT OF DAYTONA ROAD IS EXCELLENT.

CROSSING ONE OF THOMAS WHITE'S TRESTLES.

FLORIDA COAST ROUTE EXPLORED.

Though the Cleveland pathfinder, which has just accomplished the run from Jacksonville to Miami, has made no attempt to remove mountains or to make the difficult path plain, it has done sufficient useful work for the main body of tourists to appreciate its pioneer trip. There are enough natural difficulties on this run of 371.8 miles down the Florida coast without calling upon the participants to add to their difficulties by picking out a trail where automobile had never before penetrated. The coast run is possible, but only on condition that the automobile attempting it is of robust construction and handled with skill and intelligence.

James Laughlin, 3d, who drove the Cleveland 40-horsepower Pathfinder, reached Miami one day ahead of schedule, notwithstanding the breakage of a front spring between St. Augustine and Ormond. Tire trouble was *nil*, the Continentals employed being as good at the end of the trip as at the commencement. It was necessary, however, to take advantage of every bit of daylight for driving and to work on several occasions late into the night to prepare the car for the arduous trip of the morrow.

In the pathfinding trip the hardest day's work was from Grant to Jupiter, a distance of nearly one hundred miles. Grant, a city of one house and an hotel, was reached late at night from New Smyrna. Arrangements were made with some fishermen to ferry the car across the river Sebastian, where a guide was to be picked up. In the seven miles of deep woods leading to the ferry the party became lost at 2 o'clock in the morning and ran around for two hours trying to discover an outlet. A house was finally found and a guide secured. After being ferried over the river by hand power, a second guide was secured at Vero, and after plowing through 20 miles of sand, reached Fort Pierce.

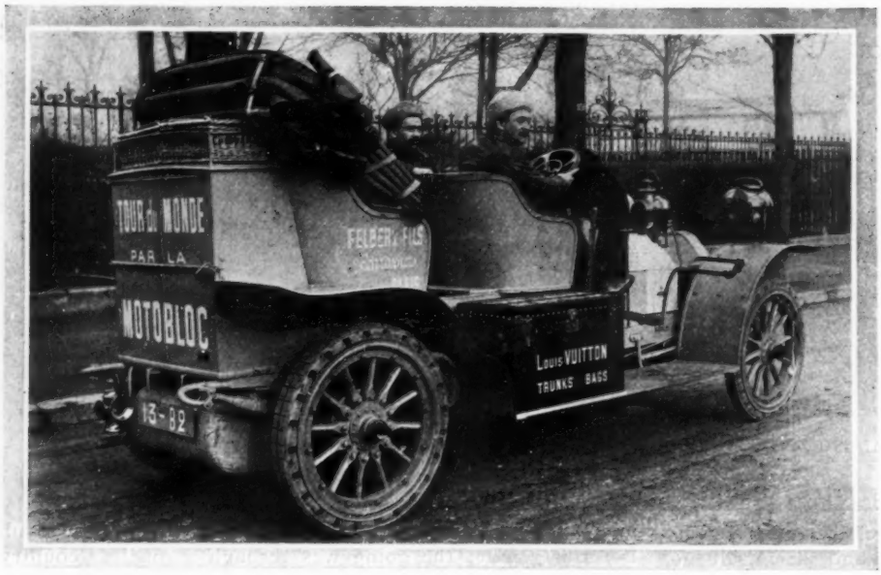
Reuben Carlton, an old-time cow puncher, here plunged the party into the deep woods in search of the Capron trail. For thirty miles the going was through a roadless country spotted with roots which frequently had to be cut away, with long wiry grass reaching up to the radiator, and swamp patches that occasionally caressed the hubs. The bridge had been washed away from one stream and it was necessary to construct a ford by digging away eight-foot banks at either side. When the car finally lunged down the steep side the angle was so steep that the driver only was able to maintain his seat. A twenty-five-mile trail through the pine wood followed, then there was a plunge into a swamp road, which called for the travelers to step out into a mocassin snake den. After more bridge building and the hacking away of stumps, Jupiter was reached at a late hour. The terrestrial city's accommodation was found to be limited to three visitors at a time. As there were five in the party two had to turn in for the night under a tent by the side of the car.

Now and again a spot would be come across where a speed of 20 to 30 miles an hour was attainable with ease. As such spots were generally through beautiful orange groves and pineapple fields, and to the accompaniment of sweet singing birds and the drone of winged insects, the 30-mile limit was quite sufficient.

There are now signposts the entire distance from Jacksonville to Miami, marking the route to be followed by the tourists, who will leave the former city on February 18. Those already entered for the run comprise a couple of Maxwell cars, two Cadillacs, two Clevelands, an Elmore, a Ford, and a Winton. There is no restriction as to horsepower or equipment, all cars being available on an equal basis, and an interesting trip is confidently expected.

BETWEEN ST AUGUSTINE AND ORMOND—MAKING A FORD.

REMOVING A STUMP THAT BLOCKED THE WAY.



HOW THE MOTOBLOC HAS BEEN FITTED FOR RUN FROM NEW YORK TO PARIS.

FEATURES OF FRENCHMEN FOR WORLD TOUR.

PARIS, Jan. 27.—Though all are destined for the same struggle, there is a wide diversity in structural features and methods of equipment of the four French cars which will be embarked on the *Lorraine* for New York February 1.

One of the first cars to be ready was the 40-horsepower Motobloc, built in Bordeaux. Structural features are a 40-horsepower, four-cylinder engine with flywheel between the two pairs of cylinders, motor, clutch and transmission forming one block—hence the name. Chain drive is employed. Except for the frame being lined with soft wood, the chassis follows standard lines of construction. Pneumatic tires have been abandoned in favor of a special type of cushion tire with individual air chambers. The body is practically a four-seated runabout, the rear seats being brought sufficiently forward to allow of a large chest being built at the rear for storing provisions and carrying parts. A rack above the chest allows for loose cases being carried. In the demonstration about town champagne cases occupied this position. Running boards are wide and fitted with trunks; searchlights are over the fore end of the mudguards; the body is covered with a folding hood, and driver and mechanic are further protected by a short leather wind shield. Patriotically the bonnet has been painted with the national colors; commercially the body bears the name of its maker, the car of its constructor, the trunks of the supplyman and the wine basket the name of a well-known brand. Godard, who will handle the car, drove the Spyker from Pekin into Russia, where he had to abandon with magneto troubles.

De Dion has selected a standard 40-horsepower model, strengthened in every feature, filled the frame with soft wood, and wrapped it with felt and insulating cloth to protect it from the cold. In the lower part of the specially designed body provision has been made for 260 gallons of gasoline. Above the tanks are commodious lockers for carrying supplies, and above this the seats, the whole being protected by a cape hood with side curtains, making an entirely closed-in car with provision for sleeping. A mast is stepped forward, the intention of the driver being to use a sail in journeys over the ice. Before the driver is a compass, a sextan, and a roll map of the country to be traversed. A small electric motor will provide light at night. Collignon and Cormier, who went through the Pekin-Paris run, have personally supervised the fitting out of the car. Hans Hendrik Hansen, the explorer, will be the driver. No expense has been spared in fitting out, and De Dion is a decided favorite among the foreign starters.

Sizaire & Naudin, being builders of a light low-powered car, have stuck to their standard chassis for the race, the vehicle being a 12-horsepower, four-cylinder car. Paul Pons, who started from Pekin on a Contal tricar, has been chosen as driver of the little car.

Little has been learned about the Werner, which M. Lelouvier, said to be the originator of the tour, will drive from New York. It is in the motorcycle and small car field that the firm has earned its popularity, and it is rather surprising, therefore, to find that a 40-horsepower engine is being used. Officials and organizers, including the *Matin* editor, will travel with the contestants to New York.

AEROPLANE'S FIRST FLIGHT ENDS BADLY.

PARIS, Feb. 3.—After flying 65 yards at Bagatelle, M. Delagrange procured a new aeroplane, almost a duplicate of the one used by Farman, and met with disaster on the Issy ground. When traveling at a rapid rate one of the propeller blades snapped off, breaking the crankshaft and cracking the crankcase. The power plant had been especially well studied, the eight-cylinder Antoinette motor being of the latest model and equipped with a tubular radiator carried in a forward portion of the frame. The forward equalizers were a feature not tried before on aeroplanes built by the Voisin Brothers. No reason can be discovered for the breakage of the propeller, the material apparently being perfect. It is expected that further trials will commence in a week.

DELAGRANGE AEROPLANE, WITH EIGHT-CYLINDER ENGINE AND RADIATOR FORWARD.

SOME OF THE VENTURI TUBE PECULIARITIES

By E. A. HUENE.

THE increasing use of some form of Venturi tube carbureter shows either a revulsion in favor of simplicity at any cost or the recognition of some element in this type which in practice accomplishes the best results achieved by other forms using some system of supplemental air orifice, or oil retardation at the nozzle. Nevertheless, a review of late contributions by various engineers upon the Venturi type fails to disclose harmony, either as to what it accomplishes or as to scientific reasons for its conduct in practice. From a late article by David Landau on "Carbureter Design with Reference to the Venturi Type," it may clearly be deduced, if not actually expressed, that it does not produce the necessary compensation between air and oil by reason of its inherent arrangement. Not being within the province of this article to question premises when the conclusions arrived at are indisputable, it is sufficient here to state Mr. Landau's conclusions: "The velocity of discharge in the various sections is inversely proportional to the area of the sections. Hence it is evident. . .that the pressure is. . .least in the smallest." With this simple explanation, we arrive at the real fact, which he sets forth thus: "When a pressure gauge is placed at *a* (Fig. 1) the pressure is found to be less than atmosphere; in fact, the fluid is discharged into a partial vacuum." After much valuable formulæ and deduction the practical conclusions arrived at are that, as to mixture, the Venturi possesses these advantages: "Homogeneity of mixture. . .reduction of wire drawing. . .and facility in starting."

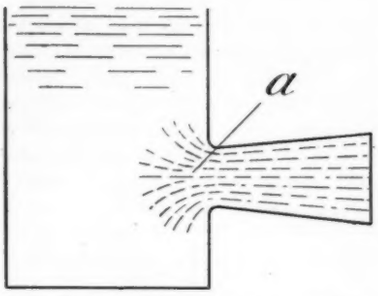


FIG. 1.—Showing point of depression.

Upon the other hand the several makers of this type for the market value it apparently as accomplishing air and oil compensation, without the complication of the supplemental air type. This view is specifically set forth as follows by F. E. Watts in his recent contribution to a contemporary on "Carbureter Requirements in Two and Four-Cycle Engines," where he says: "It is claimed with certain forms of converging air nozzles, like two hollow truncated cones with their small ends brought together, there is a point where the suction remains practically constant whatever the velocity of air flow. If the fuel nozzle is located at this point we shall, of course, have a constant mixture at all speeds."

If the results obtained with the Venturi type were in all ways equally good as those from the well designed supplemental air type at its best, it would not be worth while from any but an academic standpoint to discuss the reasons for such conduct. But it has already appeared, with but a small part of the authorities quoted, that this is still debatable ground. Consequently it seems desirable to further analyze the actions of this type and consider the laws of physics which govern them.

Take for a starting point the gauge demonstration that there exists a space, or volume of low pressure, at some point in the throat of the Venturi tube. The shape and boundary lines, even if well defined and constant, which they probably are not, are not subject to exact calculation, nor to very close observation, though the latter may be had in a rough way by constructing a tube Venturi with flat, parallel glass sides, as in Fig. 2. Upon blowing smoke through this tube, the form of low pressure space can be observed in two dimensions, as the smoke, in spite of its tendency to follow the flat glass sides to some extent, still leaves a low pressure area thereon. This area may be considered, then, as a section cut through the center of a true Venturi tube longitudinarily.

Having demonstrated that it exists, the next inquiry is as to the laws governing it, after which may be discussed the effect on the oil flow. Mr. Landau determines the matter from the following laws: "Equal quantities of air pass given points of varying section in the same time," wherefore "the velocity of the air in the various sections is inversely proportional to the sectional areas." Hence his conclusion that the pressure is greatest at the largest section and least at the smallest section, the throat. There seems some doubt, however, whether these laws fully apply to the phenomena observed, as there are some other laws governing the flow of gas and air along surfaces which, though less important in general, have much, if not complete, control of the action of the Venturi tube.

The original Venturi experiment consisted of emptying a reservoir of water by means of driving a stream of water up a gently inclined plane from the level of the stream to the edge of the reservoir. Later experiments determined that a stream of air through air or through water produced like action. Many simple experiments show this action, such as the flame of a candle bending toward a stream passed close by it, or the action of a curved vane pivoted at its center with a stream directed tangentially along one surface, when it moves toward the stream and may be made to revolve in that direction by advancing the stream; when a stream of air is blown through the bottom of a hemispherical cup in which a light sphere is lying, by the inability to dislodge the sphere which, if inverted, resists gravity. In a similar manner a light sphere may be suspended in a flowing jet of air or liquid. These phenomena are generally designated in physics as the pneumatic paradox. It is apparent that upstream surface pressure is diminished by reason of the radial streams until down stream surface pressure predominates. To more clearly understand this statement take the experiment of the hemispherical cup, Fig. 3.

Let *ab* represent the hemisphere and adjoined upstream tube, *c* the sphere and *de*, *d'e'* the radial streams. It is quite evident that friction, or adhesion, which was considered

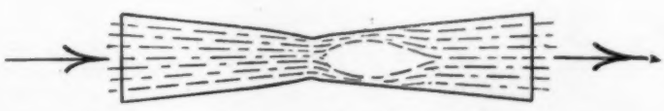


FIG. 2.—Illustrating the anomalous action of the Venturi tube.

the reason of the original Venturi phenomena, cannot here apply, as its assumption would work a quicker discharge instead of retention of sphere *c*. Nor has the presence of the hemisphere *ab* any bearing on the phenomena, as the sphere suspended in a free air jet demonstrates. Directly applied to the carbureter there will be found little in the above experiments and laws applicable, the nearest approach, probably, being that the same well known laws that do here apply solve the phenomena of the sphere, Fig. 1 and kindred. The law of centrifugal force needs no exposition, there-

fore it is only necessary to state one other law, or proposition, to wit: A moving fluid tends, on account of adhesion, to follow a surface, where the velocity of the fluid and the curvature of the surface are not too great.

Referring back it will be observed that Fig. 2, which for the moment may be considered the Venturi tube of common carbureter design, is but a modification of the hemisphere of Fig. 3, minus the contained sphere, which sphere is in the latter experiment surprisingly aprpoached in form and location by the low pressure or vacuum space of Fig. 2. The curvature of the air stream beginning at the throat is, then, caused first by the adhesion to, and consequent following of, the diverging wall surfaces. The centrifugal force tending to resist this turning once having been overcome, adds its effect in enlarging the inner, low - pressure space. Consider the oil nozzle inserted into this space of low pressure at the throat and the conditions are complete for study of the effect of carburetion. Upon induction stroke of the motor the air in the tube assumes the position shown in Fig. 2; into the low-pressure space oil from the nozzle readily expands in a finely divided state and is readily taken up by frictional contact and affinity between it and the inner surface of the surrounding shell of passing air.

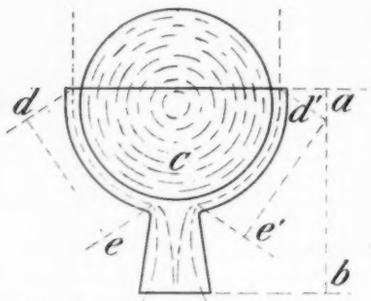


FIG. 3.—Experiment of the hemispherical cup.

Some general observations in conclusion, deduced from the matters set forth, are: That the assumption that the Venturi tube carbureter has a compensating action which neutralizes the tendency of overrichness of gas at high speed is not well founded; that it may, nevertheless, well give very good results in practice up to a certain speed for a given throat angle design on account of the homogeneity of its mixture, which is largely promoted by the location, shape and uniform expansion of its low-pressure space in action. Its limitations in furnishing a well commingled charge of gas are readily seen to be at the point where, with given throat angle and given speed, the surface tension of air following carbureter walls is overcome by its tangential centrifugal force tending to pass the air by nozzle in a circular column of constant diameter instead of as a hollow oval of varying length.

Some suggested improvements in this type are: A deflector of such form at the throat as to positively establish and maintain the radial streams around nozzle; "rifling" the throat for the same purpose, thus inducing a vortex, or whirlpool beginning at nozzle and extending downstream. By the use of a proper throat angle in this connection a low pressure space may be induced which will not contract in diameter at any induction speed, but will uniformly expand downstream. It is quite possible that this construction may promote good mixture to such an extent at all motor speeds as to leave little necessity for supplemental air compensation. If such compensation is deemed desirable, a direct vacuum oil balance is possible.

GAS POWER SECTION A. S. M. E. MEETING.

The first meeting of the Gas Power Section of the American Society of Mechanical Engineers will be held on Tuesday evening, February 11, in the Engineering Societies Building at 29 West Thirty-ninth street, New York. The subjects discussed will be varied and interesting.

PARIS 1908 SALON TO BE RUN ECONOMICALLY.

PARIS, Jan. 27.—Parisians will not be deprived of their annual display of automobiles in the luxurious palace in the Champs-Elysées, the Chambre Syndicale de l'Automobile having decided in principle to hold an eleventh annual exhibition next December. Soon after the tenth annual show turned out its thousand of electric lights the question of the advisability of holding the Salon every two years, instead of annually, was brought up for consideration. It was understood that if this were done some arrangement should be arrived at with the promoters of the rival show in London, by which the British event should also be held at intervals of two years only. Apparently no such entente was possible, and the Grand Palais will see an eleventh annual automobile exhibition before the end of the year.

The lavish expenditure which marked the tenth annual show will not be a feature of the coming event, the manufacturers' committee having decided to recommend its members to adopt a more modest type of ornamentation. The central committee, however, will maintain the same decorative display for the interior and exterior of the hall. After expenses have been met a certain part of the profits will be distributed among the exhibitors. Free entries will be considerably limited, those given being made strictly personal, either by the use of photographs on the cards or other means. Of late years free passes have been so extended by the promoters that crowding of the hall by non-purchasers has resulted.

WIRELESS TELEGRAPHY AN AUTO EQUIPMENT.

PARIS, Jan. 27.—Marconi has been taken into the automobile fold. The first application of wireless telegraphy to the most modern of methods of travel was seen at the recent Brussels exhibition, where a Pipe limousine was fitted with Marconi's transmitter and receiver. The tall mast above the roof of the limousine would doubtless be found a considerable inconvenience in touring, where overhead bridges and other obstructions are met, and there is little probability of the arrangement becoming a standard equipment on touring cars. It is stated that the automobile wireless telegraph station has been used extensively in army operations and found to be eminently satisfactory. In comparison, even the ordinary field telegraph service was vastly inferior for transmitting orders.


FIRST "WIRELESS" STATION FITTED TO AN AUTOMOBILE.

A GASOLINE METER FOR AUTOMOBILE USE*

UTILITARIAN ideas in connection with the automobile do not appear to be fertile, judging by the experience of the Association Générale Automobile, a French body which desired to develop the best apparatus for abolishing smoky exhausts, for preventing light-fingered gentry from borrowing an automobile without going through the formality of asking the owner's permission, a device to enable drivers to hear sounds in the rear of the car, to see what is passing behind the vehicle and to measure the exact amount of gasoline consumed. Schemes are plentiful, but few of them had the merit of being sufficiently practical to warrant a reward. Among the exceptions were a "Flic automobile" to prevent a car being stolen, and a gasoline meter designed by Chauvin & Arnoux.

There is a sufficiency of machines on the market for measuring liquid for the problem to appear, at first sight, a simple one. Closer examination soon shows that there is little in common between an instrument for measuring water, gas or electricity and one to be used on an automobile to indicate the amount of gasoline consumed by the engine.

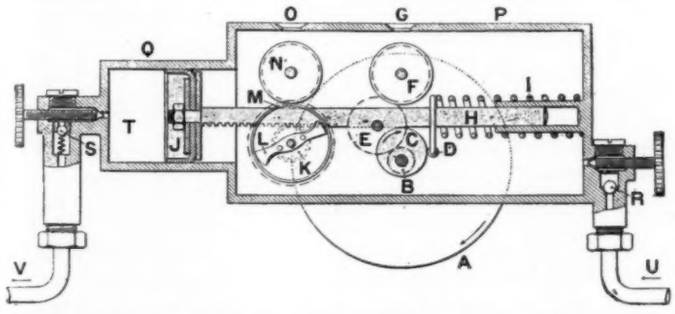


FIG. 1.—Sketch showing principle on which the gasoline meter operates. Gasoline arrives at U, is driven under pressure by the piston J into Cylinder T, and travels to carbureter through valve S and piping V. By rack and pinion M the number of liters is registered at O; number of revolutions of the crankshaft are registered at G.

The driver of a car is lord and master of every bit of mechanism about it, and although, in his case, the object is not to make the indicator show as little, but as much as possible, he could soon accomplish his ends if special pains had not been taken to thwart him. For instance, with an indicator fixed somewhere on the piping, between the gasoline tank and the carbureter, all that would be required would be to disconnect the piping at the carbureter, turn the pipe into a can and pass through as much gasoline as was considered necessary. In such a way the car would consume ten, fifteen, or twenty gallons in a very short space of time, every drop of which would have been registered without the motor making a revolution.

In the Chauvin & Arnoux instrument this has been guarded against by making the flow of gasoline impossible except when the motor is running. Thus, supposing a 30-horse-power machine consuming two gallons of gasoline per hour at 1,600 revolutions a minute, the chauffeur would be obliged to turn his engine over at 400 revolutions for four hours in order to gain two gallons. Any man who would undertake this would certainly be entitled to the fuel he obtained.

Principle on Which Gasoline Meter Is Based.

The principle of the apparatus is simple. A Pulley *A* (Fig. 1) is connected to the motor by a belt, the gearing being such that for one hundred revolutions of the motor shaft the pulley makes one complete turn. Thus, whenever the motor has made one hundred revolutions, the cam *C*, attached to the shaft of the pulley *A*, will have made one. With each revolution of the cam the arm *D* (Fig. 1) is driven to the right; as the arm is keyed to the connecting rod *H*, this and the piston are operated by the same cam. If the arm *D* is in contact with the cam the maximum movement will be obtained; if the two are separated, the movement will be in proportion to the distance between them.

It will be thus seen that the function of the cam *C* is to drive the piston from left to right, while the function of the spring *I* is to bring about an opposing movement. Supposing the apparatus to be full of gasoline, it will be readily understood that the cam, by driving the piston to the right, will aspire gasoline into *T*, under the leather-faced lips of the piston, while the spring *I* will drive the same liquid through the valve *S* to the engine.

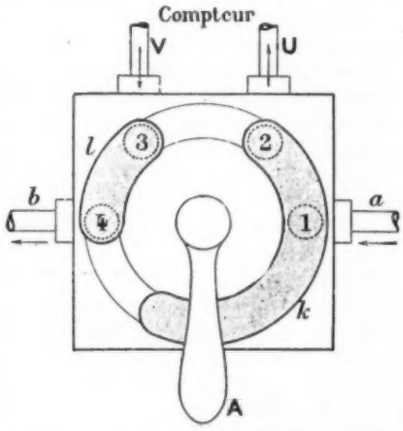


FIG. 2.—Two-way cock by which gasoline arrives from tank, is passed to the gasoline meter, and sent to carbureter. Position in sketch shows the meter open.

The amount of gasoline contained in *T* should, in consequence, be sufficient to meet the wants of the motor during the time necessary to make one hundred revolutions, for, as has already been seen, the cam *C* only causes one aspiration per 100 revolutions. The dimensions of the cylinder *Q* have been calculated so that with the motor running at full power the whole of the gasoline contained in *T* will not be consumed during the 100 revolutions. In practice, indeed it will be found that the opposite will occur, the motor being throttled down to such an extent that it will consume but a half, a quarter, or may be but a tenth of the full amount of fuel contained in *T*. In such a case, the liquid being practically incompressible, the spring *I* cannot drive the piston more than a half, a quarter, or a tenth of its maximum stroke. The reciprocating movement of the piston is therefore always proportionate to the amount of gasoline consumed by the motor. If fuel con-

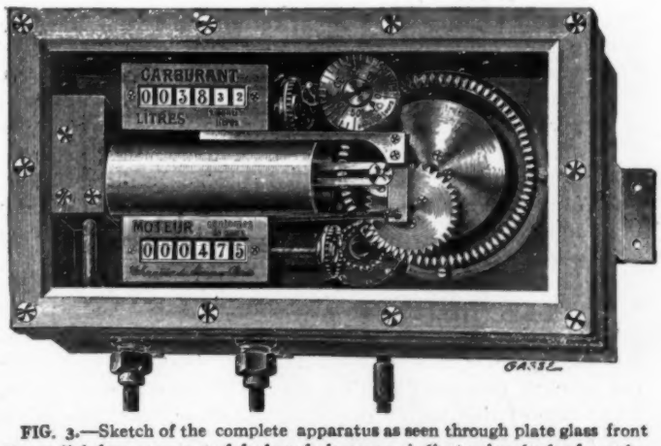


FIG. 3.—Sketch of the complete apparatus as seen through plate glass front Upper dial shows amount of fuel used; lower one indicates hundreds of revolutions of the motor. At base, outside the casing, are shown flexible shaft, inlet and outlet.

Translated from *Omnia*, by W. F. Bradley.

sumption is high the reserve in T is rapidly used up, the spring drives the piston J to the end of its stroke, and the cam C produces a complete aspiration of gasoline. Inversely, the movement of the piston is small if consumption is low.

Revolutions and Fuel Consumption Shown Concurrently.

This arrangement gives at one and the same time the number of revolutions made by the motor and the amount of fuel consumed by it. On the shaft of the cam C is mounted a pinion B, which, operating through E, drives an ordinary counter F; this registers the number of motor revolutions.

On a certain length of the connecting rod, corresponding to the maximum stroke, is a toothed rack to which is connected a pinion K carrying two ratchets operating in one direction only. On the intake stroke of the piston the pinion turns from left to right and the ratchets drive the wheel M, within which they are mounted, thus operating the counter N. Naturally this wheel is only carried round a distance corresponding exactly to the movement of the rack; if the aspiration is small, the wheel M only revolves a few teeth, and the counter only registers a small movement. When the rack moves towards the left (outlet) the pinion K turns from left to right with its ratchets, but the wheel M, and in consequence the counter N, are not disturbed. The amount of fuel consumed, which corresponds exactly to the movement of the connecting rod of the piston, as explained, is obtained in larger or smaller fractions, the volumes consumed being totalized by the counter.

It should be noted that there are two separate indicators, one registering the number of liters consumed and the other the number of revolutions of the motor. By means of these it is possible to read the consumption of the engine with the throttle at varying positions, the motor running free, or on various gears, etc. A glance at the sketch will show that the design of the apparatus is such that at every hundred revolutions a pointer moving over a dial K registers separately the amount consumed during the last hundred revolutions. The value of this hardly needs amplification. To take but a few examples, it was shown by the apparatus that the consumption of a motor in town work was considerably higher than in open country. Other things being equal, high speed is more favorable to moderate fuel consumption than is low speed. One motor on which it was tried was found to consume double the amount of gasoline when running at 500 revolutions per minute without load than when driving the car under normal conditions. If the constructor had been able to obtain use of the apparatus when testing his engine he would certainly have made changes. The loss of gasoline through leakage is readily determined by the use of the apparatus. The results obtained over ordinary roads can be noted and compared with the consumption of the engine at any future time.

How the Simple Theory Is Modified in Practice.

For practical purposes it has been necessary to make several departures from the simple sketch shown and referred to. Thus, the spring I is replaced by two long springs at each end of a balance arm, drawing the piston towards the left. A comparison of the two designs, Figs. 1 and 4, will show in what respects the simple principle has had to be modified to obtain a practical application. The eccentric B has been replaced by a disc carrying a short shaft E'' on which the wheel E revolves. The pinion E is twice as small as the fixed tooth wheel W, and disengages from this latter to allow the movement of the piston obtained by the eccentric.

The disc W is driven by the shaft B'' operated by a worm gear through a flexible shaft connected up to the crankshaft of the motor, the camshaft, or the pump shaft, as may be most convenient. The entire mechanism is contained in a metallic case with a strong glass front, every part thus being visible from the outside. To the connecting arm carrying the two springs is attached a metallic band X, which drives the drum K in one direction only. A small spring maintains the band stretched to its limit; the arrangement within the drum is the simple one of a ratchet and free wheel. It is by means of this dial K that the consumption per liters per hour can be obtained instantly. If, for instance, at the moment of aspiration the indicator marks the figure 20, the driver knows that, providing the same conditions are observed for one hour, the consumption of the motor will be 20 liters.

Under the gasoline meter is installed a two-way cock by means of which the flow can be opened or cut off.

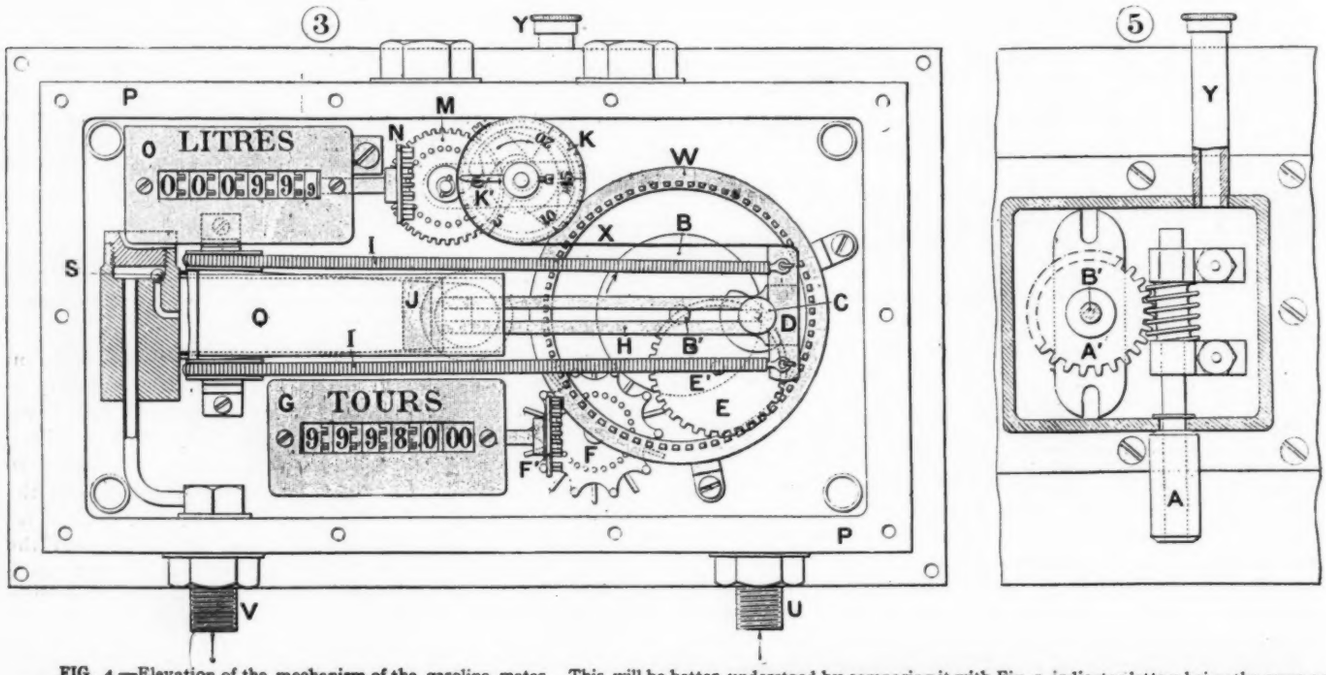


FIG. 4.—Elevation of the mechanism of the gasoline meter. This will be better understood by comparing it with Fig. 1, indicator letters being the same on the two. Fig. 1 shows the elementary simplicity of the apparatus; Fig. 4 represents it as it is actually constructed.

LETTERS INTERESTING AND INSTRUCTIVE

ABOUT RETIMING A MAGNETO.

Editor THE AUTOMOBILE:

[1,133.]—Will you kindly give me some information as to how to time a Bosch high-tension magneto that has been removed from a four-cylinder engine, without first having marked the gears or couplings, whichever may be used for driving it?

Saratoga Spa, N. Y. A FRIEND.

Open the petcock of the forward cylinder, or take out the spark plug, if located in the head, so that the position of the piston may be noted. This may be done by taking a piece of small gauge stiff wire and inserting it in the hole thus made. Turn the engine over until the wire ceases to drop and starts to rise again. This will give the lower dead center and the upper dead center may be found in the same way. Take off the valve covers of the same cylinder and, by noting the action of the valves, turn the engine over slowly until it is brought to a point where the piston of the first cylinder, counting from the radiator rearward, is at the upper dead center and about to start downward on a power stroke. This will be the case where both the valves have remained closed during the last upstroke, corresponding to the compression.

Uncover the contact breaker as well as the distributor of the magneto, and turn the shaft of the latter by hand until the armature is in a position where the contact breaker has just opened the circuit to fire cylinder number one. Mesh the driving and driven gears of the magneto drive as closely as possible at this point. It may be found necessary to move them half a tooth one way or the other to effect this, and this should be done with the magneto gear. The allowance for advancing and retarding the time of circuit opening in the latter will compensate for this. Reassemble and test the engine in this position. If it is found that there is insufficient allowance for timing the spark one way or the other with the coupling in this position, disconnect the magneto and move ahead or back one tooth and try again. For running under normal conditions the spark should occur a short time before the piston reaches the upper dead center prior to a power stroke.

VALUE OF LONG OR SHORT STROKE RODS.

Editor THE AUTOMOBILE:

[1,134.]—Please advise me if the wear on connecting rods in a short stroke engine is greater than in one with a long stroke. A practical repair man, disinterested in the make of any automobile, claims that where there is a long connecting rod, the angle is not so acute, which prevents sidewise thrusts on the connection at the crankshaft, thus preventing the wear and tear at this point. Theoretically this seems to be correct, but does it apply practically? The Reo makes a long stroke engine, the Maxwell short stroke, and by inquiry I learn that the latter owners have no more connecting rod adjustment to do than the former. Can you explain where above mechanic's views are wrong in columns of "Letters Interesting and Instructive?" L. C. BURGARD.

Columbia, Tenn.

The mechanic is quite correct in stating that there is less strain imposed on the connecting rod of a long stroke motor than where the latter is very short, owing to the angle at which the latter operates and the fact that you do not find any great difference in a single instance is hardly sufficient to disprove this. It is correct both theoretically and practically, but the difference between what is a "long" and a "short" stroke in the case of an automobile motor is slight—so much so that the corresponding difference in the service rendered is practically a negligible quantity. The longer stroke also imposes less side thrust on the cylinder wall, this being overcome to a great extent in many instances by offsetting the cylinders on the crankshaft center.

HOW TO TEST VIBRATOR COILS.

Editor THE AUTOMOBILE:

[1,135.]—Referring to letter No. 1,132, in which the writer suggests that 1-4 ampere is ample to get good results from dry batteries, would like to know how to make this test. I have a four-cylinder Winton and always carry with me a pocket ammeter. In adjusting the buzzer on the coil I have always simply examined it to see if it would vibrate, and nothing more. Can I with a pocket ammeter regulate the coil so that I will use only 1-4 ampere, and where do I connect the ammeter to make this test? Must the connection be made with the buzzer on the coil, or where?

Newark, N. J. F. H. THOMPSON.

The ammeter should be connected directly in the primary circuit, that is, the wire leading from the battery to the coil to be tested so that all the current employed will pass through it. To do this, disconnect the battery wire from the coil and connect it to one of the terminals of the instrument; the second terminal of the latter should then be connected to the coil so that the ammeter practically forms a link in the circuit between the battery and the coil. Start the engine and run it at about normal speed. Then adjust the vibrator until the current consumption is reduced as low as it possibly can be, consistent with good running of the engine. However, the ordinary ammeter, or battery tester, is not well adapted for making such a test, as it is calibrated to read up to 25 to 30 amperes and, as a consequence, the divisions are very small. Special instruments are on the market for this purpose, their scales only reading to 3 amperes by tenths. Owing to the fluctuation of the needle it would be practically impossible to adjust a coil to take not more than .25 ampere with the ordinary battery tester, as the needle will swing over several divisions of the dial, amounting to as many amperes, every time the current passes.

IS THE IGNITION TIMING DERANGED?

Editor THE AUTOMOBILE:

[1,136.]—Please inform me how you could connect the ground wire and positive wire so as to make a magneto run. Does it call for a two point switch? The magneto is connected to the motor.

I also wish to know why I can advance throttle and spark the full length of the quadrant when clutch is disengaged without a knock, but running on the level or on a hill with the spark half way advanced, I can at no time when the clutch is engaged advance the throttle of not over quarter way without getting a knock. Even doing this I get a knock going down. I know it is not in the bearings, or because of carbon, as all have been cleaned. I thought perhaps the gearing of the car was too high. Please give me all the information you can. F. R. B.

The data you give concerning your magneto is very ambiguous, but we presume it to be of the low-tension type, as you speak of a "positive wire," by which we presume you mean one taken from the generator to the ignitors. There is generally no outside ground connection on a magneto, whether low or high tension. The winding of the armature is grounded on the core of the latter, so that fastening the magneto in place on the motor grounds it without further attention. By "connected to the motor" we presume you mean a mechanical connection, but are not certain; in fact, find it impossible to get at just what you wish to learn and must ask for further and more detailed particulars.

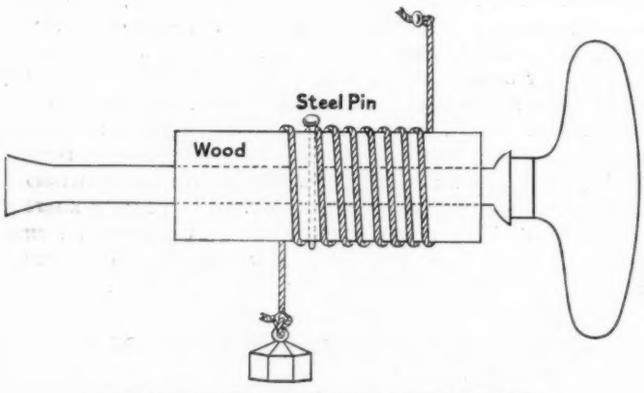
Regarding your second query, if you are quite certain that the knock is not due to the bearings, which cannot be presumed without a close examination, particularly in view of the fact that the engine will run quietly when idle, it would appear that the ignition timing may be deranged. That is, the actual occurrence of the spark in the cylinder takes place at a point greatly in advance of what is represented by the position of the spark-advancing lever, so that the result is

equivalent to that of preignition. That is, going on the assumption that neither loose bearings nor carbon deposits are the cause. Your suggestion that the gearing may be too high, in turn suggests the question, Has the car always given this trouble, or is it something of recent origin? An inherent fault such as this would be more than likely to show itself earlier in the use of a car. Investigate the ignition timing, also the bearings, and see if one or the other is not faulty.

HOW TO MAKE A HOME-MADE VALVE-GRINDER.

Editor THE AUTOMOBILE:

[1,137.]—As I am very much interested in your "Letters Interesting and Instructive," I wish to do my share in making it interesting to others. The enclosed cut will speak for itself. It is a home-made valve-grinder. I made it from an old brace such as is used by any carpenter. I straightened out the crank part and then cut it off about 8 inches long, heated it and made a regular screwdriver point on it; then, forcing the hand off the top of the rod, I bored a hole in a piece of pitchfork hand and slipped it on the rod, pinned it fast by a steel pin, after boring an eighth of an inch hole clear through wood and steel rod. I then took a stout, heavy cord and tied a knot in it and then to the pin, gave it several turns around the wood and fastened a weight to the lower end and took hold of the upper. In this way I can seesaw and grind a valve in good shape. In case one does



DETAILS OF THE HOME-MADE VALVE-GRINDER.

not have a horizontal engine and the valves are vertical, one can work it with both hands or it can be worked without the cord. I find this one of the handiest tools I have in my set, which I always keep in the auto tool box. In my motor I have an opposed air-cooled engine, laying horizontal under the seat; it is a 4 by 4, and the fan flywheel, instead of driving the air from the engine, sucks the hot air away from the engine. Is this the best plan? Seems to me if the engine would drive the hot air off the cylinders instead it would not heat as quick. V. R. LANE.

West Liberty, Ia.

The sole object of the fan is to induce a draught of aid over the heated portions of the engine and whether it does this in one way or another is immaterial. In fact, on many present-day cars, both bethods that you speak of are employed, the fan behind the radiator drawing cold air through the latter and throwing it on the engine, while the flywheel fan draws the warm air away from the engine.

FIGURING THE RATIO OF PLANETARY GEARS.

Editor THE AUTOMOBILE:

[1,138.]—Will you kindly tell me in your next issue what the ratio is between the low speed and direct drive in a planetary transmission as follows: Driving gear on crankshaft 20 teeth, pinions on spider or driving sleeves, 12 teeth, internal gear 44 teeth. Now, when the internal gear is held stationary, how many revolutions does spider or driving sleeve make to every 100 revolutions, and what is the rule for determining the above?

Calumet, Mich. GRANVILLE BENSON.

Let G = driving gear on the shaft = 20 teeth; I = internal gear = 44 teeth; P = pinions = 12 teeth. With the internal gear I held and the central gear G running as a driver to reduce the speed, the planets or pinions P turning on studs in the spider, it will be evident that G will have to make one more complete turn to drive the planet round its orbit than the direct relation between the driving gear and the internal gears G and I. Thus with G half the size of I, the ratio would be 3 to 1, and with the figures you supply, it is 3.2 to 1. In the same manner, when the planet is made the driver, it will give the central gear one more turn than the ratio between the internal gear and the sun or central gear. The easiest manner to figure this is to divide the internal gear by the central gear and add one, which will give the low-speed ratio in this case. There are probably a dozen or more different methods of calculating these ratios, many of them of a highly complicated nature, but where the number of teeth in the various gears are evenly divisible, they may be figured without any great difficulty by adding or deducting one turn, according to which gear happens to drive.

FIGURING THE POWER OF TWO-CYCLE ENGINES.

Editor THE AUTOMOBILE:

[1,139.]—Will you please send me the formula for figuring the horsepower of a two-cycle engine? A. J. OESTERBECK.

Chicago,, Ill.

About as simple a formula as any is the following, $\frac{D^2 \times L \times R \times N}{18{,}000}$ = Horsepower, in which D is the diameter of the cylinder, or bore; L, the length of the stroke in inches; R, the number of revolutions per minute, and N, the number of cylinders, while the denominator is an arbitrary quantity based on the use of gasoline as a fuel. There are numerous other ways of figuring the power of a two-cycle engine, though the foregoing will be found as simple as any, and likewise about as accurate as any of the others. The brake test is really the only definite means of knowing what an engine's capacity is. The only difference in calculating the indicated horsepower of a two-cycle engine, as compared with a four, is to allow for the extra power impulse.

MORE IN AID OF MR. WEBB.

Editor THE AUTOMOBILE:

[1,140.]—In letter No. 1,117, J. S. Webb asks for information in regard to a Ford runabout. Last summer a car was pulled into the garage where I was employed; it wouldn't go. The motor acted as Mr. Webb's did, and they could not make it run. The first thing I did was to test the coil, and found that one of the vibrators was stuck in such a manner as to short-circuit the current and keep the other buzzers from going. It would fire on the stuck vibrator, but not good and strong, as it should. After this was fixed it would stop the whole engine on high speed, and it would stick partially and cause the motor to miss, as if it was faulty carburetion. Finally, by changing the units and putting in new platinum, the difficulty was overcome.

Would you kindly advise me through your columns if there is a technical school for learning automobile engineering as you would learn any other branch of engineering? E. A. MARTENS.

Roselle, Ill.

The New York School of Automobile Engineers, located at 146 West Fifty-sixth street, New York, offers such a course as you inquire about.

USING A VOLTMETER TO TEST CELLS.

Editor THE AUTOMOBILE:

[1,141.]—I made a mistake in my query. Is a voltmeter as hard on batteries as an ammeter when testing? LOWELL ELLIS.

Warren, Mass.

Owing to its high resistance, a voltmeter does not run a cell down in the same manner as an ammeter, but testing dry cells with a voltmeter gives but little indication of their condition, as a cell may show practically full voltage and still be all exhausted. The voltmeter, however, should always be employed in connection with storage batteries; in fact, it is dangerous to use an ammeter on a fully charged accumulator and is apt to result disastrously to both the ammeter and the accumulator.

CAN ANYONE SUPPLY THIS INFORMATION?

Editor THE AUTOMOBILE:

[1,142.]—I have a runabout which is a Buckmobile. I bought it second hand. I cannot find out where it is made, nor do I know, but I think the firm that made them is out of business. Will you, if you can, give me the address of the firm if it exists, and if not, who could I address that could give me information about it? J. H. TOWNSEND.

Danbury, Conn.

We do not know the address and are under the impression that the firm is out of business. Probably some of our subscribers can furnish more definite information on the subject.

TO USE GAS IN A GASOLINE MOTOR.

Editor THE AUTOMOBILE:

[1,143.]—I would like to have you advise me what changes have to be made in the ordinary gasoline engine to use illuminating gas as fuel. T. F. W.

Providence, R. I.

It is only necessary to remove the carbureter and connect the engine to the gas supply through the intermediary of a gas-mixing volve, which can be obtained from any supply house. The function of this valve is to mix the gas and air in the proper proportions to obtain a suitable fuel.

VIEWS OF A TIRE EXPERT ON REPAIRS.

Editor THE AUTOMOBILE:

[1,144.]—In your issue of January 23 I notice that you have a subscriber who wishes to know the best cure for a blow-out in an automobile tire. As I am considered an expert on tire works I have decided to give you my opinion. There is only one way of curing a section or blow-out, and that is in a steam vulcanizer in a sectional mold. That is dry heat, created by steam, and the heats of such cures depends entirely on the stocks used on repairs. When you put a section in a tire and place it on a rim, and wrap it and put it into a steam kettle, you certainly overcure the old rubber and make it soft, and when it does dry, it will harden and crack. It is also liable to separate the fabrics. It is all right to put a retreaded tire through the kettle, as that is the simplest method. Of course, some tires are molded in a complete mold.

A section or blow-out repaired properly with good stock and cured properly with a strong pressure on air bag in the proper mold cannot be equalled in strength, looks, or service by a wrapped steam cure.

I am doing repair work for the best house in Boston and have very rarely a section come back that has done less than 500 miles and in many cases over 1,000 miles. I cure all my casings in an automobile tire vulcanizer with section molds. Only yesterday I cured fifteen sections, and they were all perfect and hard to beat for looks or strength. I have made tires in two factories and worked in three. Have been repairing bicycle single tubes, automobile tires, and the up-to-date tires of all makes and descriptions, and want to see the tire I cannot repair if it is profitable to the owner of such tire, since 1896—about eleven years—and I think my opinion is worth considering.

My ideas of repairing are my own and cannot be beat like other tire men. I keep them to myself because it makes my business better. I pass judgment on about 3,000 tires in a season.

Boston, Mass. JAMES P. BROPHY.

IN REBUTTAL FROM MR. POOLE.

Editor THE AUTOMOBILE:

[1,145.]—As Mr. Fay's reply (No. 1,124) to my comment (No. 1,106) on his article consists chiefly of quibbling, it is rather difficult to continue the discussion in good temper. Mr. Fay originally made the broad general statement that the mixture drawn in by a gasoline engine at high speed is poorer than that drawn in at low speed; he did not say that this was true if the carbureter had an auxiliary air valve poorly adjusted; he stated it as a general proposition without reference to the type of carbureter used. He evidently realizes now that his statement was erroneous and tries to take refuge behind the fact that his article contained an illustration of a carbureter with an auxiliary air valve, to which no reference was made in connection with the criticised statement. This not only is unfair, but it does not make his original statement true as it stands.

The question of scavenging is a difficult one to discuss. I can only say that experiments made by myself and others have shown that, within the limits of rational engine speed, better scavenging is obtained at high than at low speeds, provided the exhaust valve is not too small for the engine. With a properly proportioned exhaust valve, increased speed will, by reason of the increased "suction" effect of the outgoing exhaust gases, give better scavenging up to the speed where the increased friction of the exhaust passages just neutralizes the increased suction effect; beyond this point, the scavenging effect decreases rapidly with increased speed for which the engine is adapted. Of course, I am referring to engines working on the four-stroke cycle and taking practically the same quantity and quality of mixture per cycle at all speeds. In making a general statement of any kind it is usually understood that all conditions remain fixed except those affected by the statement.

Mr. Fay's quibble over the word "combust" is unwarranted. He deliberately clouds the discussion by talking about "combustion" and "combustible," to which terms I did not refer at all, and indulges in some irony about the age of dictionaries. The facts in the case are these: Mr. Fay used the verb "to combust" in the sense of "to burn"; the verb "to combust" means to cause popular clamor or to excite the public mind, and no matter how ancient Mr. Fay's preferred dictionary, he will find in it that definition, in substance; the definitions of "combustion" and "combustible" have nothing to do with the definition of "to combust" and were not referred to in my letter. CECIL P. POOLE.

New York City.

INTERESTING EXPERIENCE AND INFORMATION.

Editor THE AUTOMOBILE:

[1,146.]—In reading over your "Letters Interesting and Instructive" in the current issue, I felt inspired to write the following:

Regarding letter No. 1,113. Your correspondent might find considerable trouble, at times, from the timer binding posts contacting with pieces of the crankcase, transmission, etc. The timer is tucked away carefully in a cute little nest under the dash between the planetary change gear and engine frame. I often had this trouble. Maybe I should have said wires, instead of binding posts grounding.

Concerning the carbureter trouble. Your correspondent speaks of "dash regulation," which suggests the Holley carbureter. I have a Holley on my Model N; it has dash control, and I have a trouble similar to the one described in your paper. Mine was caused by the cork float absorbing gasoline and changing the level in the air passage.

C. S. G. states, in letter No. 1,128, that for 6,000 miles his car only cost him 4 1-2 cents per mile to operate. Repairs alone cost me almost that. I got my car last June, and started keeping records July 1. On December 1 I totaled things up. In that time, five months, I had driven same 3,500 miles, used 215 gallons of gasoline, paid out $125.70 for repairs and replacements, of which $22.30 went for dry cells and $22.35 for springs, new and repaired. I got wise and put in a Holley magneto and stopped all ignition expenses thereby. I used 22 gallons of lubricating oil, getting only about 160 miles out of a gallon, and I declare I don't see how anyone can possibly get 500 miles with one of these cars. Expense per mile sums up like this:

Replacements and repairs	.358	per mile
Cleaning and garage rent	.068	" "
Gasoline (24 1-2 cents per gallon)	.150	" "
Lubricating oil	.050	" "
Tires	.100	" "
	.726	per mile

Since I have had the car, I have spent a little over $200 on improvements, which covered lamps, magneto, carbureter, top, etc. Have a very trying road to travel, 10.1 miles each way, over natural Colorado roads, good a short time, and full of chuck holes most of the time. Make this trip nearly every day; are building a mill at the terminus, concrete. Drive a good bit besides this, for pleasure.

The machine has done very well indeed, and while I have had villainous carbureter and ignition troubles, before I tore out the crude equipment that came with the car, have never failed to make my trips on schedule, 40 minutes. When the road is heavy with mud, as it is very rarely, probably has been for two weeks altogether in the time mentioned, it takes seven minutes longer to make the trip. However, the car is now pretty well racked; every rivet is loose from the eternal jarring. T. B. RENNELL.

Florence, Col.

TO THE SUPPORT OF MR. FAY'S VIEWS.

Editor THE AUTOMOBILE:

[1,147.]—As Mr. Fay says, the needle valve is a makeshift, and should not be tolerated on any well designed car, for reasons as follows:

It complicates the carbureter by making extra parts. It is something for the novice to fool with when he wants "to improve the running of his car." It destroys the true nozzle effect. Its construction is such that it gives a very small opening all around itself—the least bit of dirt, corrosion, water or in fact almost any-

thing is prevented from passing. It is not at all essential to the operation of the carburetor.

Only last week, having a carbureter to adjust on a two-cylinder, 4x4 3-4-inch engine, I made an experiment as follows: The carbureter was adjusted by the needle valve, float and air valve, to give the best results and the performance of the car noted. Three nozzles were then made with fixed openings, Nos. 54, 57 and 60 drills being used. Nos. 54 and 57 were tried and found too large. No. 60 was then tried and found to give fair results. No. 54 was plugged with solder and reamed out slightly smaller than No. 60. This gave as much power and speed as with the needle valve, without any of its faults, besides being able to run the car at a very low speed with little or no vibration, an impossibility before the change was made. The principal reason for making the change was the constant plugging up of the nozzle on account of the very small opening around the needle valve, obliging the driver to get out and open the valve, to wash the obstruction out. This same trouble was on a number of cars the writer has had to do with.

The needle valve seems to be a feature of the cheaper American cars, being very seldom used on the high grade cars, and practically not at all on the foreign cars.

If as Mr. Poole says, the scavenging effect is better and the timing of the spark is as accurate, the engine should deliver its maximum power at its highest speed, which is very seldom the case.

C. T. BATES.

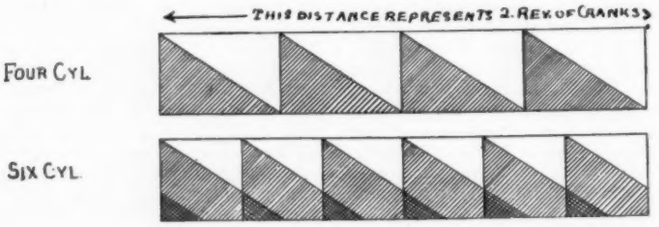
South Easton, Mass.

MORE IN SUPPORT OF THE "SIX."

Editor THE AUTOMOBILE:

[1,148.]—I beg leave to take up the cudgels in the four-cylinder versus six-cylinder controversy. It seems to me that many of the articles lately appearing in the various trade papers and magazines are written either by people who are ignorant of the actual properties of the six-cylinder engine, or else know nothing of the practical mechanics of the gasoline engine in general.

If the ones who are always howling about the sixes being no better than the fours would only take a little ride in a six, they would soon change their minds. The six has less vibration than



HEAVILY SHADED PORTIONS DENOTE THE OVERLAPPING.

GRAPHIC COMPARISON OF FOUR AND SIX-CYLINDER.

the four, and no amount of theory can disprove this. The six furnishes stronger driving power than the four at all speeds, is more silent, has more perfect carburetion, and is as simple to take care of as a four. Anyone doubting these facts would do well to investigate the six thoroughly. In regard to the comparative simplicity of the two types of motor there seems to be a good bit of disagreement. For instance: "Fifty per cent. more ignition apparatus," shouts one manufacturer, while another facetiously replies that "if a four-cylinder motor requires one magneto, we hasten to assure an innocent and unsuspecting public that a six-cylinder motor does not require one and a half magnetos." Take the magneto as a concrete example; is the six magneto 50 per cent. more complicated than the four? Not by quite some. It has two additional contact points, with no more moving parts, and that is all. Again, it seems perfectly natural that an engine maintaining a continuous suction in the carbureter will get a more perfect mixture than one that keeps up only a fitful and constantly varying suction.

Some of the authorities (?) in the automobile world seem to lose sight of the original object of their argument in their anxiety to outdo each other in this so-called "nature faking." Then, again, there seem to be others who bring in arguments that have no foundation in fact, and palm them off as convincing. Two gentlemen, for instance, claim the remarkable powers of producing constant torque by means of carbureters and flywheels respectively. I cannot help but feel sure that there is a fortune awaiting both of these gentlemen when they succeed in doing what they claim to be able to do. No matter how heavy the flywheel, at every impulse of the piston it is going to receive a certain amount of acceleration, and during the succeeding idle stroke (in a single cylinder, for example) it is going to lose a certain amount of its momentum. That the torque of such an engine should be called continuous seems queer, to say the least. Also, I would like very much to see the carbureter that will make the power strokes overlap as in a six. In order to show this overlapping graphically I am enclosing a rough drawing which may serve the purpose.

While I am at it, I would like to take sides with Mr. Fay in his discussion on carbureters. As he says, when a carbureter is especially designed for the engine to which it is attached, and if it takes its air supply through a perforated sleeve surrounding the exhaust pipe, the quality of the air entering the carbureter remains so nearly constant that a non-adjustable spray nozzle will give most excellent results. But if the carbureter has a plain cold air supply, absolutely unheated, every change in the temperature and humidity of the air will affect the mixture to an appreciable extent; a fault that can be most quickly and easily remedied by changing the amount of gasoline flowing through the nozzle. It would seem, therefore, that an adjustable nozzle would be best in such cases. I may add that these last facts concerning carbureters are taken from actual personal experience.

GEORGE SAUTTER.

Newark, N. J.

FROM AN OHIOAN ABOUT BLIND DRIVERS.

Editor THE AUTOMOBILE:

[1,149.]—I have read with considerable interest in your issue of January 23, the account concerning a bill which is soon to be up before the Ohio Legislature, and gotten up by the Hon. Elijah Hill, to make it lawful for a blind man to operate an automobile in the State of Ohio. Living in Ohio myself, I am, of course, very much interested, else I would not have given the article a second thought. There has been, from time to time, various schemes brought forth for the purpose of drawing revenue from the autoist, but this one seems to be about the cap sheaf of them all. It would seem to me that any person whose vision is in any way impaired would drive in a very careful manner or else quit the game entirely, if only for his own safety.

This bill not only hits the owner, but the chauffeur as well, who must dig up five of his hard-earned plunks to help maintain this soft, specially created $1,500 job, and all he has to show for his money is a paper which tells him he can see just as good as he could before.

I sincerely hope that when the bill comes up it will be killed dead, for I and, I think, a good many other Buckeye autoists are tired of constantly paying out five dollars for this and five dollars for that. However, my views may be wrong or prejudiced; if so, I am willing to stand corrected.

R. J. THOMPSON.

Orlando, Fla.

THE TROUBLE IS IN THE TIMER.

Editor THE AUTOMOBILE:

[1,150.]—Some three or four issues ago, in Letters Interesting and Instructive, I noticed a communication from a man who owned a Maxwell car. He had experienced trouble with a motor missing, particularly at high speed, and he believed that the trouble was in the carbureter.

The writer is very familiar with the Maxwell, and I am positive that the trouble was not in the carbureter. As a matter of fact, the Maxwell car, though not automatic, is simple, and not liable to get out of order. I believe the trouble in this case was in the commutator. The tension is controlled by a small spring. This frequently loses its elasticity, so that when the motor is speeded up the spring is not able to return the arms into position in time to make the next contact.

If your reader will put on a stiffer spring, or attach two of these springs instead of one, I think he will have entirely eliminated the trouble. Of course, the trouble may also have been with the contact arms, as well as the cam being badly worn. If this is the case, it is a very inexpensive matter to replace with new contacts.

New York City. H. A. GRANT, M.E.

IN AID OF A FORD OWNER.

Editor THE AUTOMOBILE:

[1,151.]—In your issue of January 23 I note the trouble had by J. S. Webb with his Ford runabout in regard to throttle action. Have had a like experience with my car and remedied it by draining the gasoline tank, in which I found a little water, which was the cause of the trouble. I think if Mr. Webb will do likewise and put in a new supply of clean gasoline it will eliminate the trouble.

J. C. JEKEL.

Independence, Ia.

ROADS INFORMATION WANTED FROM GEORGIA.

Editor THE AUTOMOBILE:

[1,152.]—Kindly answer in the columns of your "Letters Interesting and Instructive" the following: Are the roads in Southern Georgia, near Waycross, too sandy to drive an automobile on?

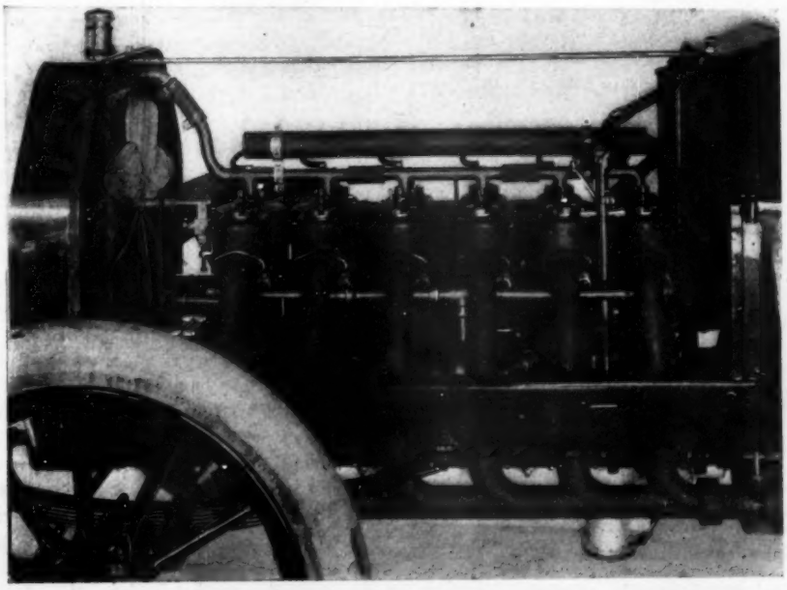
Toledo, O. H. L. Y.

: THE SIX-CYLINDER, 75-HORSEPOWER GEARLESS LIMOUSINE FOR 1908.

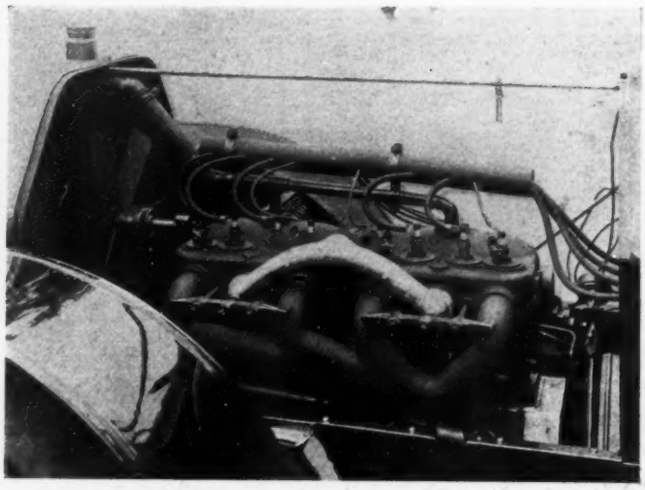
THOUGH the line of Gearless cars for 1908 will comprise three distinct models, doubtless the makers—the Gearless Transmission Company, Rochester, N. Y., will devote a large part of their time and attention to the production of their Model 60, which is a convertible five or seven-passenger touring car. The cylinders of the motor of this model measure 5 inches bore by 5 3-4-inch stroke and are offset on the crankshaft center. They are cast in pairs and the valves are all placed on the same side and are operated from a common camshaft placed on the left hand side of the motor. The crankshaft is turned from a solid billet of high-carbon steel and is finished by grinding. It is supported on three liberal-sized bearings of Parson's white brass. The valves themselves are made of nickel-steel, and advantage has been taken of the method of valve arrangement to place all the auxiliaries of the motor on the right hand side, thus making them very accessible. The timer and magneto are both located at the rear, just forward of them is the carbureter, the intake pipes being led over the tops of the cylinders between the two pairs, thus making an extremely simple intake manifold, as will be evident from the valve side of the Model 60 motor, which is shown herewith.

Further forward on the same side is the mechanical force feed oiler, having eight individual leads, which are taken to the main bearings, the lubrication also being supplemented by splash in the crankcase. Dual ignition is provided, one system comprising a self-contained unit in the shape of a Bosch high-tension magneto, while the other consists of a standard four-unit vibrator coil, low-tension timer and set of accumulators as a source of current supply. Independent spark plugs are employed for each system, those connected with the magneto being placed over the inlet valves, while those of the second system are placed over the exhaust valves.

The heavy car of the Gearless line is officially known as Model 75, and more familiarly as the Gearless "Great Six," which is equipped with a six-cylinder, 75-horsepower motor. The latter also forms the power plant of the "Gearless Greyhound," which is the third member of the line and is a high-power roadster model of the same type that made a name for itself by accompanying Weston at a four-mile-an-hour pace for almost 800 miles last November. In consequence the description of the motor of the touring car will apply to both. The cylinders measure 4 13-16-inch bore by 5 1-2-inch stroke. The valves are oppositely disposed and have their seats water-jacketed, while the carbureter is placed on the right hand side of the motor, a very simple type of manifold being employed. The Bosch high-tension magneto employed for ignition is also placed on the same side of the motor, two independent systems being employed as on the smaller motor. Simplicity and accessibility have been the aims of the designer throughout, the gears for operating the camshafts, timer, magneto and pump consisting of a steel pinion on the crankshaft, two bronze gears on the camshafts and steel pinions on the latter operating the magneto and pump. These gears are all housed in an aluminum casing and are run in oil, thus being free from grit and mud. The water



THE SIX-CYLINDER ENGINE, SHOWING ITS COMPACTNESS.

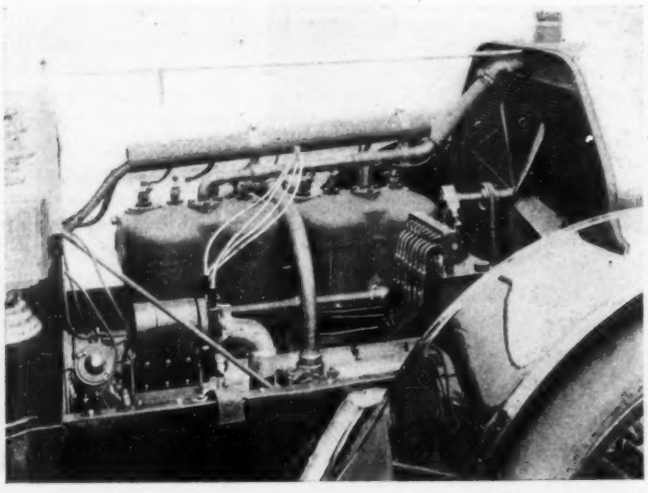


INTAKE SIDE OF THE MODEL 60 MOTOR

pump is of the centrifugal type and is permanently fastened to the engine.

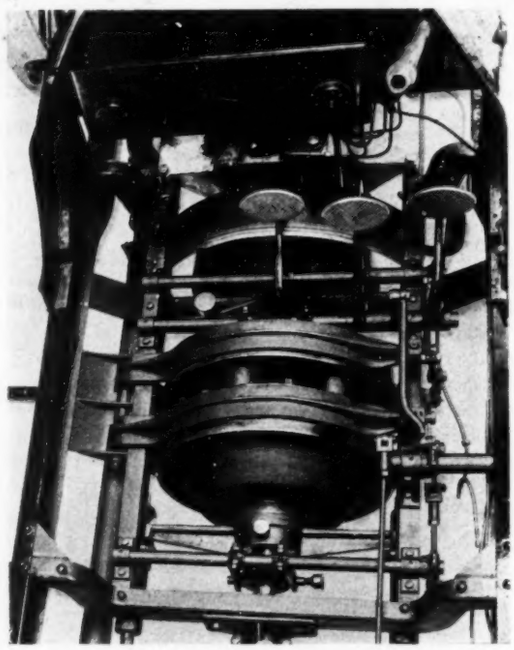
To provide the necessary lubrication, a supply tank of oil is attached to the forward face of the dash, thus placing it in a position where the oil is constantly maintained at an even temperature in spite of weather conditions. From this tank individual tubes of liberal diameter lead directly to the main journals of the engine. Upon reaching the main bearings, which it serves to lubricate, it passes into holes drilled through the crankshaft, so that it also oils the crankpins. This oil is drawn to the pins by centrifugal force and from there is thrown off in a fine spray, thus taking care of the piston and cylinder lubrication as well as that of the wrist-pins, combining in this manner all the advantages of the force feed and splash systems of lubrication. The surplus oil drips down from the interior of the motor and collects in a receptacle formed in the aluminum oil pan on the bottom of the motor, from which it flows to a pump by gravity and is automatically returned to the supply tank, first passing through a fine-mesh double screen which thoroughly cleans it.

The carbureter is of the multiple jet type, two independent jets being employed. It is employed in connection with a piston throttle and is water-jacketed, thus economizing fuel and facilitating the starting of the motor in cold weather. The advantages of this type of carbureter are that it practically embodies two carbureters in one, allowing the driver to handle the car at very low speeds with the throttle nearly closed, using the small carbureter only. By opening the throttle further, the larger carbureter comes into action automatically, thus supplying the engine with the proper quantity of fuel at different speeds. In this motor both spark plug terminate in the intake valve pocket, those of the magneto being placed at the side and at right angles to the cylinder, while the others are placed over the valves.



EXHAUST SIDE OF THE MODEL 60 MOTOR.

As is naturally to be supposed, while the motors of the Gearless cars are by no means lacking in distinctive features, interest centers in the change-speed gear from which the cars take their names. This is the patented gearless transmission, giving two speeds forward and reverse without the use of any gears, the high-speed being direct, in which the change-speed elements revolve together as a unit, with no internal friction nor rolling contact, the entire change-speed unit revolving together as a flywheel. It consists of six large special fiber rolls of conical shape revolving on and in an exterior and interior cone. These two cones coact with a sliding, double-faced, solid jaw clutch, which



PLAN VIEW OF THE PATENTED GEARLESS TRANSMISSION.

is moved to the extreme forward position to give the low speed forward, and to the extreme rearward position to give the reverse. The internal cone is constantly pressed toward the external cone by means of a spring, so as to always insure "bite" enough to make the six cone rollers revolve without slipping in the low speed and reverse drives.

The Gearless transmission has the advantage of no change-gear friction whatever on the high speed, or direct drive, and rolling friction engagement in the low speed and reverse. The coned rollers are held laterally in a cage of large diameter and press against a gray iron cone made fast to the extension of the motor shaft. On their opposite faces they press against an internally faced cone, also of gray iron, and which is concentric with the propeller shaft of the car. The cone, roller and cup angles are such that the three elements roll together without any sliding, and hence without sliding friction, save in case of the slipping of the six rollers. To avoid the slipping of the rollers on the cone or in the cup a heavy spring pressure is applied to the cone cup to force it towards the driving cone, this pressure being sufficient to make it impossible for the motor to slide the roller surfaces on the cone or in the cup.

Development of the Two-Cycle Elmore

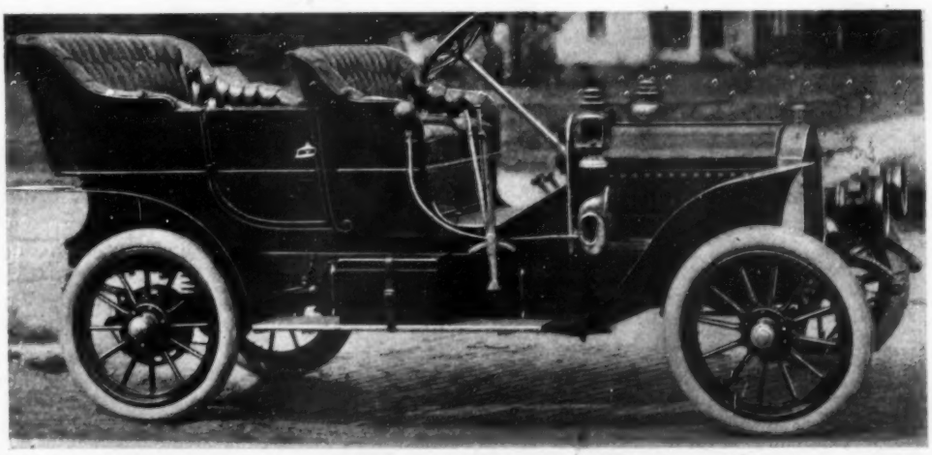
THE ELMORE "40"—THE TWO-CYCLE, FOUR-CYLINDER, "VALVELESS" CAR.

SO far as the substantial elements of their construction are concerned, the Elmore cars for 1908 are, well—the Elmore cars, for there are so many distinctive features about these consistent advocates of the two-cycle principle that nothing short of this suffices to describe them in a word. Numerous improvements have been made on the models for this year, chief of which has been the adoption of the Atwater-Kent spark generator as the means of ignition. The makers of the Elmore, the Elmore Manufacturing Company, Clyde, O., had this system under test for a long while prior to its formal adoption as a part of the standard equipment of their cars, and it showed up so strongly under the most rigorous of tests that its adoption was a foregone conclusion right from the start. The installation of this system on the 1908 Elmore cars has enabled the builders of the latter to achieve results in battery economy in the running of their cars that are almost incredible. As a matter of fact, every one of the carefully conducted tests made by the company showed that it was possible to get more than 2,000 miles' running out of a single set of six No. 6 dry cells, which is said to be many times greater than the average mileage obtainable with any other ignition system employing dry cells as the source of current supply.

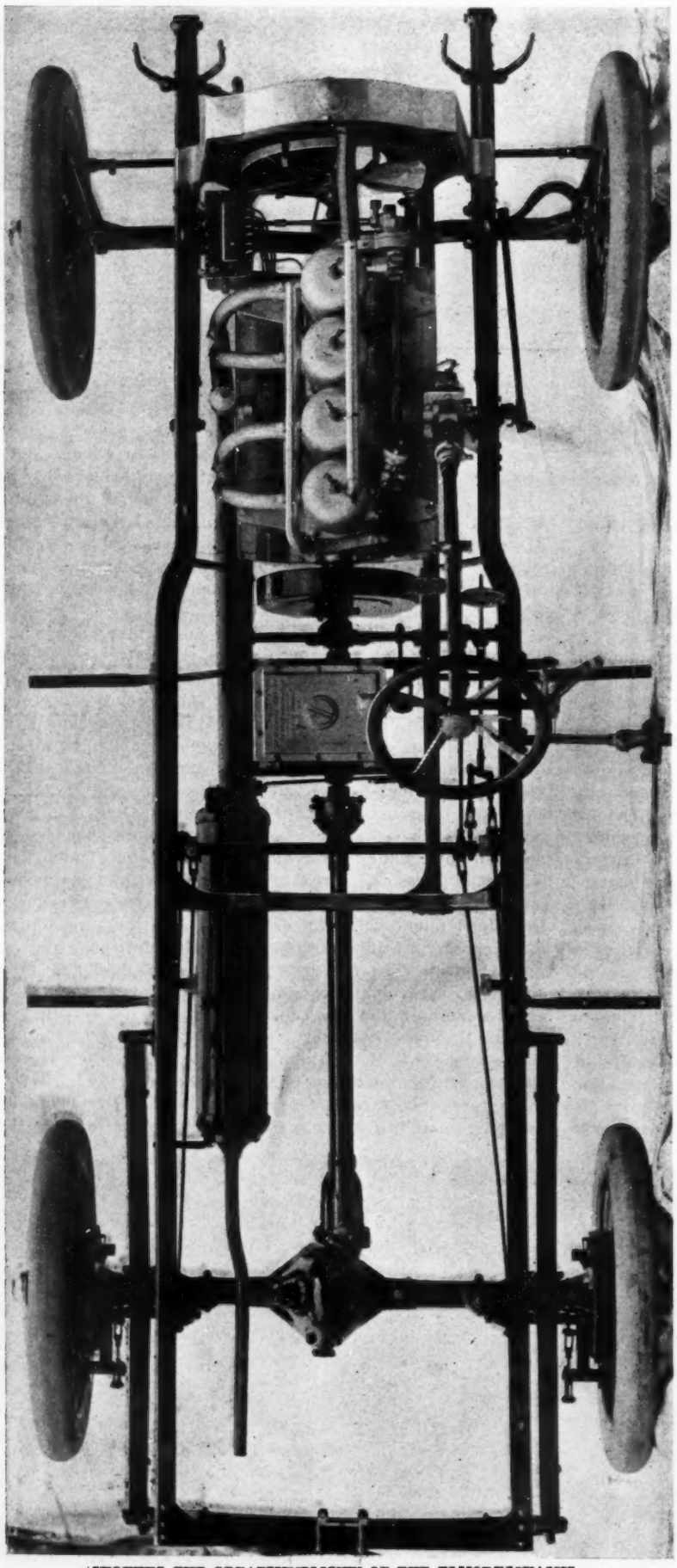
The builders of the Elmore still retain the distinction of being the only makers turning out a three-cylinder car, this being their 24-horsepower model, known as the Elmore 30, which is listed both as a touring car and a roadster, the chassis being the same in each case. The heavy car of the line is the Elmore 40, which is the four-cylinder type rated at 40 horsepower. Some of the changes in design made since the preceding year are the placing of the steering arm of the knuckle above the axle instead of below as in the former years, thus protecting it from injury when traveling over rocky roads or bad country. The hubs are now made extremely large, and the balls and hubs of the bearings are now made larger than was the case in last year's models. The belt drive of the oiler has been done away with in favor of a more positive and reliable drive. An improved type of irreversible steering gear has been adopted, this being so constructed that all lost motion due to wearing of any of its parts can readily be compensated for by a simple adjustment. The power plant and all the elements of the transmission, such as the clutch, gear box, propeller shaft and rear-axle unit, have been brought practically into the same horizontal plane, thus minimizing the wear on the universal joints and giving a higher percentage of efficiency at the rear wheels. A honeycomb type of radiator constructed of seamless tubes has been adopted, thus eliminating the frequent trouble from leaks where soldered joints are employed.

Where the motor itself is concerned, lighter pistons are now used than was formerly the case, this being also true of the connecting rods, which are now one-piece drop-forgings. So far as the principle or operation of the motor is concerned, there have been no radical changes. It is the three-port, two-cycle, water-cooled type, the water being circulated by means of a gear-driven pump. The cylinder dimensions are 4 inches bore by 4 1-2 inch stroke, giving the car a speed range of from four to 45 miles an hour on the direct drive. On good level roads, these cars can attain a maximum speed of 55 miles an hour, while their flexibility is surprising. The makers lay special stress on the reliability of the lubrication employed on the Elmore cars, this taking the form of a mechanical force-feed oiler, which forces the oil into the intake pipe, thus insuring an even distribution of the lubricant to all of the cylinders. The carbureter is of the standard float-feed, automatic type, while, as already stated, an Atwater-Kent spark generator and dry cells take care of the essential of ignition.

The gear-set is of the sliding type working on the selective plan of operation by means of a single side lever, and provides three speeds forward and reverse, the final drive being by propeller shaft to the live rear axle. Shafts are fitted to the



ONE OF THE FEW THREE-CYLINDER CARS MADE HERE—THE ELMORE "30."



SHOWING THE GREAT SIMPLICITY OF THE ELMORE CHASSIS.

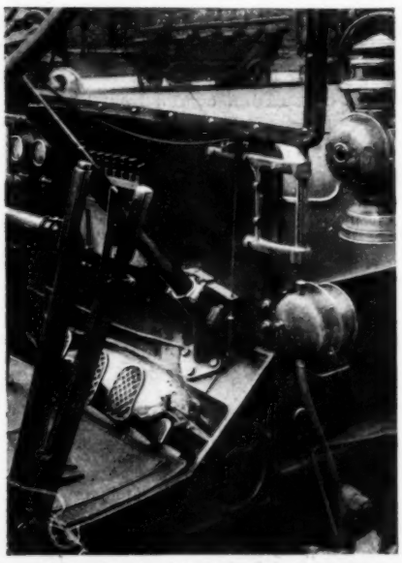
differential by means of squared ends and they are supported on Hyatt roller bearings and are provided with special thrust bearings. The front axle is a single-piece drop-forging with an extra heavy spindle supported on ball bearings, the inside bearings being equipped with 3-4-inch balls and the outside bearings with 5-8-inch balls. Suspension is by means of the standard type of semi-elliptic springs forward with a three-quarter platform type of suspension in the rear, supplemented by Sager auxiliary recoil springs on the rear axle as shock absorbers. The running gear consists of wooden artillery wheels fitted with Midgely universal rims, the tires fitted being of the same size all round in the case of both cars. On the Elmore 40 the tire equipment consists of 34 by 4-inch tires, and on the Elmore 30, and the roadster as well, of 32 by 3 1-2-inch tires. The brakes are centered in hubs on the driving wheels and are of the internal expanding and external contracting types. Their efficiency is very great, either set being capable of bringing the car to a halt within a short distance, only a slight pressure being required to cause the wheels to slide. The tread is standard on both cars, the wheelbase of the Elmore 30 being 104 inches, while that of its larger four-cylinder brother is 110 inches.

The dashboard of this car is made of mahogany, ornamented with a very heavy brass moulding so placed as to be free from vibration. The toe-board angle has been raised so as to make it much more comfortable than in the previous models. The gasoline tank has a capacity of 20 gallons of fuel, while the mechanical oiler holds six pints of lubricant. As the Elmore 40 will average 12 miles to the gallon of gasoline under any ordinary touring conditions, the radius of the car is very easy to keep in mind. The specifications of the Elmore 30 and the Elmore roadster are identical, while the design and construction of both are carried out in the same thorough manner that characterizes the larger car, or Elmore 40. The latter is listed at $2,500, while the three-cylinder car lists at $1,750 in either type.

From the accompanying plan view of the Elmore chassis, which shows the Elmore 40 equipped with a four-cylinder, two-cycle motor, it will be quite apparent that the claims for simplicity and accessibility do not center entirely upon the power-plant, as the lines of the chassis of the car as a whole are quite in keeping with its motor on this score. There is a noticeable absence of complication or small parts, both the design and construction being distinguished by close adherence to the best standard practice, the chassis foundation consisting of the usual channel section pressed steel frame, the motor and change-speed gear being carried on a special sub-frame, while the propeller shaft is inclosed in a heavy steel tube which serves both as a protection and takes the place of the usual torsion rod. The use of the sub-frame for supporting the power-plant and drive permits of the latter being a close approach to a horizontal plane from the flywheel to the rear axle.

MECHANICAL HORN AND PORTABLE RECTIFIER.

Under the title of Klaxon, a new type of mechanical horn, which has much to recommend it on the score of simplicity and efficiency, has recently been produced by Miller Reese Hutchison, a New York engineer. The Klaxon horn consists of only two fundamental parts, a vanadium steel diaphragm and a hardened steel cam wheel. Attached to the center of the diaphragm is a hardened steel anvil, against which the cams on the periphery of the cam wheel strike, producing a violent inward and outward movement of the diaphragm, with astonishing results in sound propagation. The diaphragm and cam wheel are mounted in a special case, from which leads a flexible shaft that connects to a friction wheel engaging the periphery of the flywheel of the engine. This friction wheel has a grooved face, the tops of the grooves being sharp and hardened, so that should there be oil on the face of the flywheel, the sharp surfaces cut through and engage the wheel without mechanical slip. A distinctive feature of the friction drive is the manner in which the wheel is pivoted to a bracket attached to the lower part of the dash and normally held by a spring against a braking surface. A chain passing over a suitable pulley on the dash and leading up to the steering wheel allows the horn to be put into operation instantly. On releasing hold of the chain the friction wheel is brought against the braking arm again with consequent instantaneous stopping of the sound. The cam wheel is so small and the power required by the Klaxon so slight that the sound reaches its maximum instantly and stops instantly without subjecting the flexible shaft to the starting and stopping torque.



KLAXON HORN IN POSITION ON CAR.

For automobile use the horns are made in two styles, one being short for the dissemination of the sound through a large angle and intended for city and suburban use, while the other is 12 inches over all and intended for touring or use on motor boats. But the horn is designed to have a much wider use than on automobiles, and in view of its efficiency—for it is certainly one of the most powerful sound producers ever created—should be adopted on trains, fishing boats, or even, as is claimed, for use on battleships.

The device can be attached to cars in a few minutes. To make it adaptable to any position or any machine, both the driving shaft and the bracket supporting the pulley have been made reversible. Where not possible to operate the horn by friction, electricity can be employed by attaching a small electric motor. The apparatus can also be adapted for hand operation.

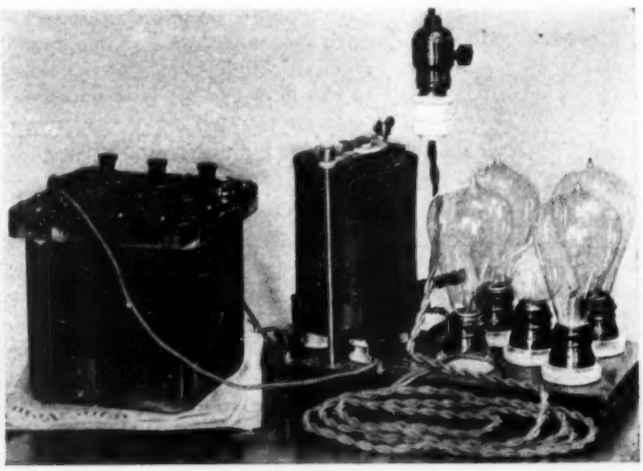
Charging Storage Batteries with the Hutchison Rectifier.

Automobilists who use storage batteries for their ignition system are frequently handicapped and delayed by inability to recharge when desired. The difficulty is particularly felt in rural districts, where, although there may be current, there are not the facilities necessary to make use of it for charging purposes. It is for this reason that a portable charging device, capable of being carried with facility on the running board of the car, will be welcomed by those who travel by automobile. A device of this nature has been produced by Miller Reese Hutchison, forming, as will be seen from the illustration, a compact and easily portable apparatus. When not in use it is contained in a strong metal case and carried on the running board.

With an apparatus of this nature the automobilist is enabled to charge his battery from any existing electric light socket by merely removing the incandescent lamp from the socket and inserting the plug attached to the charging device. When the plug is inserted and the wires connected to the battery as designated by the tags, the charging device assumes two rôles: it enables the user, if the current is what is known as direct current, but which is seldom used in rural districts, to charge the battery so that the positive wire of the line is connected to the positive wire of the battery, as it should be. If it is alternating current the device rectifies it into direct current, and in such a way as to charge properly.

When connection is made to the electric light socket the lamps shown mounted on the board and used as resistance will light, showing that the battery is being charged properly and no further attention is needed. If they do not light, or burn with a very dull glow, it shows that the current is alternating and that the charging device is not properly connected. It is then necessary to pull apart the little plug screwed into the socket, then reinsert the bottom half of the plug, having turned it one-half revolution before inserting. This reverses the current through the device and through the battery, and the lamps will burn. A switch on the baseboard allows the battery to be disconnected from the charging circuit, and the small central lamp to be connected up. If the battery is fully charged this lamp will burn brilliantly. As the lamp uses considerable current, the temporary apparent charged condition of the battery is quickly run down if it is not fully charged, and although it may burn brightly at first, it will soon become dim. This test allows the state of the charge of the battery being determined without the use of delicate electrical instruments.

The elements of the rectifier consist of two large aluminum plates and one central composition plate, mounted on a support that has attached thereto a couple of lugs which engage the rods leading from the base on either side of the jar. Improper connection is prevented by these rods being of different sizes, with the holes in the connecting lugs each corresponding to the size of its rod. The jar is filled with an acid solution, the acids, which are cheaply renewable, being supplied with the apparatus, and is then ready for use. The contents of the jar being emptied out after charging, there is nothing to spill over and disfigure the box or apparatus.



CHARGING A STORAGE BATTERY THROUGH HUTCHISON RECTIFIER.

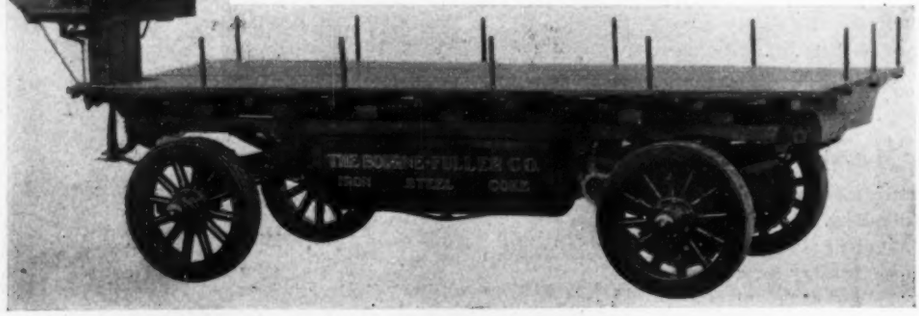
RAMBLER MOVING SHOP EQUIPMENT AT LOS ANGELES.

ANOTHER USE FOR THE UTILITY AUTOMOBILE.

Moving machinery is the latest use to which an enthusiastic owner of a Rambler has put his car. He is D. C. Wilgus, a manufacturer of Los Angeles, Cal., and the manner in which some of the machines were moved from the old establishment to the new is made clear by the accompanying photograph. The feat which this Rambler Model 22 performed was actually the transfer of a complete machine shop from one point to another, the equipment including planers, lathes and general machine tools.

STUDEBAKER TRUCKS FOR HANDLING METALS.

Two new electric trucks of 3 1-2 and 5 tons capacity that have recently been delivered to the Bourne-Fuller Company, of Cleveland, O., by the Studebaker Automobile Company, of South Bend, Ind., are of more than the usual interest in that they serve to show the adaptability of the electric vehicle to a wide variety of special uses. They are probably the first ever built with special reference to the convenient handling of steel and iron bars, sheets and strips, the driver's seat being located at the extreme left, thus making provision for the overhanging of extra long bars both front and rear. This construction permits of the easy handling of much longer pieces than could be carried on the average horse-drawn truck. Another interesting feature of these trucks is their tire equipment, which is of wood, thus materially reducing their cost as compared with the maintenance of rubber tires on such a vehicle. They are fitted with broad platforms, partly lined with steel to prevent wear. Both trucks are of exactly the same design, though of differing capacities and are mounted on the regular standard Studebaker electric chassis of the sizes and types in question.

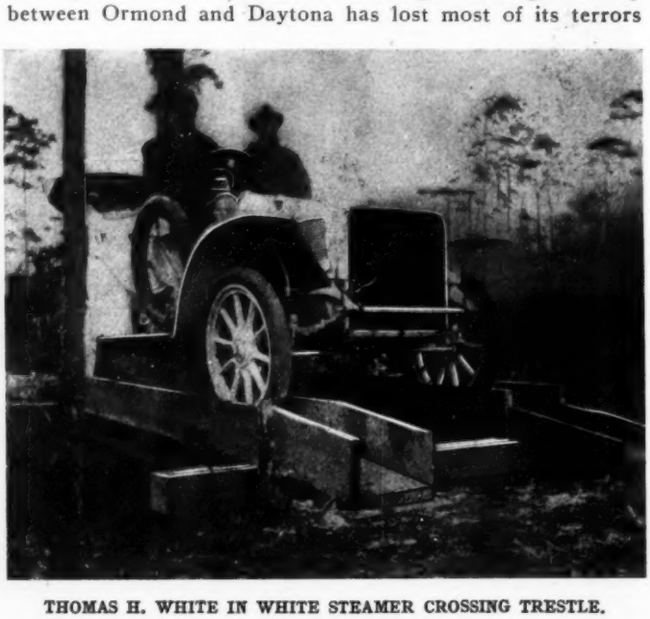


STUDEBAKER ELECTRIC TRUCK, MODEL 2126-C, 10,000 POUNDS CAPACITY.

BRIDGING FLORIDA STREAMS FOR AUTO USE.

One of the greatest drawbacks in any country where the roads are not well settled and maintained is the lack of bridges to cross the more or less frequent streams and gullies. The route between St. Augustine and Ormond, Fla., is characterized by quite a number of such bad spots, or at least it was, until Thomas H. White, president of the White Sewing Machine Company, Cleveland, O., and of which the White Automobile Company is an offshoot, undertook to remedy this state of affairs. Mr. White has a winter country home at Daytona and frequently makes the trip from here to St. Augustine. It occurred to him that suitable bridges for automobiles could be made for the great number of small creeks without going to a great expense, and he accordingly went to work and devised what his neighbors have dubbed the "Incomparable White Motor Car Trestle," a sample of which is shown in service by the accompanying photograph.

It is practically two troughs supported by suitable stringers and tied an equal distance apart by cross pieces, this distance corresponding to the tread of a car. Since Mr. White has actively undertaken his work of bridge building, the trip between Ormond and Daytona has lost most of its terrors and more tourists are making it than ever before. In addition to this work, Mr. White has also had the laborers from his estate "brushing" the roads—in other words, freeing them from projecting branches and brush.



THOMAS H. WHITE IN WHITE STEAMER CROSSING TRESTLE.

RUSHVILLE'S DOCTORS ALL USE AUTOMOBILES.

INDIANAPOLIS, IND., Feb. 3.—According to records in the Secretary of State's office, the city of Rushville, about forty miles east of Indianapolis, has more automobiles in proportion to its size than any other city in Indiana. Incidentally, Rushville is probably the only city in Indiana where 100 per cent. of the physicians use automobiles.

Rushville is the county seat of Rush County, which is said to have the finest farming land in the State. Physicians, business men and citizens use automobiles, and two garages have all the work they can do. There are fifty-five automobiles in the city and one motor cycle, three of the automobiles being electric.

HORSE-DRAWN STATISTICS THAT INDICATE AUTO'S GROWTH

THE United States produced one million and a half horse-drawn vehicles, the majority of them being family and pleasure carriages, during the year 1905, the latest period for which returns are available. Tremendous as has been the growth of the automobile industry, it appears as yet to have had little influence on the growth of the carriage industry, according to complete figures compiled by *Commercial America*. In 1810 the aggregate value of the products of this industry for the whole country was $1,421,000; by 1880 this had increased to $65,000,000, and in the fifteen years that have elapsed since that time the value of the products of the carriage and wagon industry has grown until it amounts to $125,000,000. How this last total has been modified by the automobile it is impossible to say with any degree of certainty, for, owing to the prosperous condition of the country, the two industries have grown concurrently, and have not yet been brought face to face in industrial conflict.

937,000 Carriages Made in 1905.

There were manufactured in 1905 no fewer than 937,000 family and pleasure carriages, most of which remained in the United States, export trade only being a minor feature. Naturally there will always remain a limited number of users who, by preference or supposed economy, will remain true to the horse and buggy, but the total given, which represents a value of $55,000,000, shows that there is still a tremendous field which the automobile builder may invade and reasonably hope to capture by quicker, cheaper and more economical methods of mechanical transportation.

The most popular of all types of horse-drawn carriage is the buggy, used as much for business as for pleasure purposes. Its use as a pleasure vehicle is probably larger than is generally supposed, as is shown by the fact that when the farmer has had a profitable season the farmers' boys are large purchasers of these vehicles for other than business uses. With road conditions as they stand at present, it is in this field that the automobile builder, has the widest possibilities for immediate expansion, with a mechanical vehicle reduced to its simplest forms.

Scope for Auto Conquest in Commercial Field.

There is equal scope for conquest in the commercial field—though the change there is not likely to be effected with the same facility—in the 643,000 wagons for business and farm use turned out in 1905 at a value of $37,000,000. In addition, 127,000 sleighs and sleds, valued at over $2,500,000, were produced during the same period. There were also 8,676 carriage bodies, 8,855 wagon bodies, and 389,266 wheels made in the carriage factory. Deducting $28,000,000, the value of all other products, from the gross value, leaves $97,000,000 to represent the value of the finished vehicles of all classes. One of the distinctive features of the carriage and wagon industry has been its specialization; whereas in the early days the entire work of manufacturing was done in one establishment, now separate factories make a specialty of the different parts, very few, if any, manufacturers making a complete vehicle.

Establishments Decreased, Capital Increased.

Though the number of establishments has decreased from 6,204 in 1900 to 4,956 in 1905, the amount of capital invested has shown a decided growth and now reaches $126,320,604. The total cost of material used is estimated at $61,215,228. In this amount rubber tires figure for $2,626,889. The following table will give a comparative summary of the statistics of the carriage and wagon industry for the years 1880, 1900 and 1905:

	1905.	1900.	1880.
Number of establishments....	4,956	6,204	3,941
Capital	$126,320,604	$109,875,885	$37,973,493
Salaried officials, clerks, etc...	5,058	4,003	
Salaries	$5,239,043	$3,576,915	
Wage-earners, average number	60,722	58,425	45,394
Total wages	$30,878,229	$27,578,046	$18,988,615
Men 16 years and over.....	59,411	57,209	43,630
Wages	$30,525,515	$27,264,021	
Women 16 years and over...	870	840	273
Wages	$266,674	$248,071	
Children under 16 years.....	441	376	1,491
Wages	$86,040	$65,954	
Miscellaneous expenses	$10,182,614	$5,800,687	
Cost of materials used.....	$61,215,976	$53,723,311	$30,597,086
Value of products, including amount received for repair work	$125,332,976	$113,234,950	$64,951,617

Of the total number of establishments reported in the United States in 1905, 38 per cent. were located in cities having a population of at least 20,000 and the value of their output was $70,000,000, or 56 per cent. of the total for the United States. In the States, Ohio leads with the greatest value of carriage and wagons for 1905, followed in order by Indiana, New York, Michigan, Illinois and Pennsylvania.

America's Only Foreign Market Competitor.

Exports of carriages, wagons and parts only amounted to $4,270,000 in 1906, the countries supplied being Argentina, Canada, Mexico, Great Britain, Australia, South Africa and Cuba. America's only competitor in foreign markets is Great Britain, which exported to the value of $1,540,000 in 1906, or about 70 per cent. of the amount handled by the United States. French exports consist mainly of very fine and expensive carriages, this being the only class of goods in which it competes with the United States.

FIGURES THAT IMPRESS ALL WHO STUDY THEM.

"That automobile popularity is far from waning, as many pessimists have endeavored to make us believe, is strongly contradicted by the registrations with the Secretary of State at Albany during 1907," says S. H. Mora, maker of the Mora car and a member of the American Motor Car Manufacturers' Association. "During 1907 there were 13,980 owners registered and 9,386 registrations for chauffeurs, against 11,649 owners, and 7,335 chauffeurs in 1906. To me these figures are impressive, as they must be to anyone who will study them. It means that the American manufacturer is offering the public the very best car possible to build for the money; or else, the sales of American cars would not have had such an increase during the past year."

7,000 PENNSYLVANIA LICENSES SINCE DEC. 15.

PITTSBURG, Jan. 27.—More than 7,000 automobile licenses have been issued by the automobile division of the State Highway Department of Pennsylvania since December 15. This is a big increase over the corresponding period of 1907.

Automobilists of Western Pennsylvania are agitating a system of uniform signals to be adopted throughout the State. The signals suggested are as follows: One blast: "I am going straight ahead"; two blasts: "I am turning to the right"; three blasts: "I am turning to the left"; four blasts to mean: "Your lamp is out"; five blasts to mean: "Do you require help?"; two and one to mean: "Yes"; two and two to mean: "No." Such a system of signaling would doubtless be of value if automobilists can be induced to adopt it unanimously.

THE AUTOMOBILE

Vol. XVIII Thursday, February 6, 1908 No. 6

THE CLASS JOURNAL COMPANY

Flatiron Building, Madison Square
New York City

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ENGLAND:—Illiffe & Sons, Limited, 20 Tudor Street, London, E. C.
FRANCE:—Boyveau & Chevillet, 22 Rue de la Banque, Paris.
GERMANY:—A. Seydel Mohrenstrasse 9, Berlin.

Entered at New York, N. Y., as second-class matter.

The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

Copies printed in 1905 - - - - - - - - - - - - 730,000
" " in 1906 - - - - - - - - - - - - 791,000
" " in 1907 - - - - - - - - - - - - 888,900

Hailing the Small Runabout with Enthusiasm. So much success attended the privately organized races for small runabouts last year that the Automobile Club of France has decided to precede its annual race for the Grand Prix by a speed contest limited to this class of diminutive automobile. Apparently the movement will not stop here, for there is already a distinct demand in English automobile circles for a race of a similar nature.

The class of machine which it is sought to popularize and develop is a little two-seater with an engine not exceeding 3.9 inches bore for a single cylinder, or, roughly, fifteen horsepower. As America has already proved in two or three notable instances, there is an almost unlimited demand for a popular machine of this nature, selling from five hundred to one thousand dollars; the demand, too, will be confined not to one or two countries, but to every land where roads exist. It is surprising, therefore, that greater official attention has not been paid to such an important section of the automobile industry. In France it was necessary that there should be serious indications of the limit of expansibility in the large car trade before whole-hearted attention was paid to the popular runabout. Once realized, however, there has been no delay in entering into what promises to be a field of activity that will equal the trade in automobiles de luxe.

It would be interesting to see the one American constructor who has resolutely invaded Europe with a four-cylinder runabout lined up against the products of the old world. Despatches received from across the Atlantic appear to indicate that the representative of the firm in question will not race because the limited bore makes it impossible to put in the stock American car. It is for the manufacturer alone to say whether it is worth while to construct special baby racers; it is certain, however, that the American industry would gain more at home and abroad by participation in races of this nature, or organizing contests on similar lines, than in running in expensive high speed tests.

✷

Expanding the Market for American Automobiles. In beginning this with the title given, there is no intention of further dwelling upon that subject, which is being so constantly brought up—the benefit to be derived from seeking export outlets—but rather to call attention to one phase of the influence of the comparatively new buggyabout that appears to have been generally overlooked. Cars of this type have been on the market for several years, but it is only within the past two or three that they have assumed any great importance. It is evident that the car selling for a few hundred dollars cannot be marketed profitably by the same selling methods that characterize the disposal of $5,000 cars. To give proportionate returns, the sales must be large, so that the average dealer accustomed to handling larger cars is naturally not over-enthusiastic about the buggy type.

Here is the carriage dealer's opportunity, and there appears to be little doubt that this trade as a class recognizes the value of the opening and will take advantage of it, particularly as the far-sighted ones in this business have long been feeling the influence of the automobile and have wished to get in line with the advanced movement rather than array themselves against what they knew was inevitable. In this manner the number of automobile agencies in the country will be increased by thousands of new dealers in a short space of time, nor is it to be anticipated that with a little experience such dealers will confine themselves to the smallest cars, so that in the course of a year or two the sales of American cars at home should expand greatly by reason of the number of people selling them, even if no other cause were present. It marks a long step forward in the education of the public to the automobile.

✷

New York-Paris Run Will Be a Good Educator. In ten days the world will have an opportunity of making a comparative inspection of the machines intended for the longest and most exacting automobile tour ever conceived by an imaginative Gallic mind. The six foreigners being already in mid-Atlantic may be considered certain starters, and four of them at least appear to have been constructed and fitted out with a determination to go through to the end. Though so near at hand, practically nothing is known of the four American cars, still announced as being ready to line up in Times Square on February 15. A sufficient explanation for the smallness of the home contingent is to be found in the briefness of the period between the announcement of the event and its practical execution. But inspiration cannot be forced, and it would be unreasonable to demand an exception of the *Matin* publicist.

When everything has been said on the uselessness, the foolhardiness, the absurdity of the New York-Paris automobile tour—and enough could be said to fill the ample columns of both journals interested in its execution—the fact remains that it will have a general educative value unequaled by any other demonstration. Automobile construction is not likely to profit one iota, but the automobile industry throughout the world will benefit by an immense publicity which could not have been obtained in any other manner. For three months the eyes of the entire world will be focused on the small group of cars, and the world cannot but be impressed by what the automobile is capable of doing.

TWO-CYCLE VS. FOUR-CYCLE IN GRAND PRIX RACE

PARIS, Jan. 27.—The voiturette race to precede the French Grand Prix will probably see the inauguration of the two-cycle motor as a racer. The club having decided to allow two-cycle motors to compete in both events under the same conditions as those of the four-cycle type, four firms at least have made the announcement that they will enter the small car race with single-cylinder two-cycle motors of 3.9 inches bore. Instead of 15-horsepower, which is about the maximum from a 3.9-inch four-cycle engine, it is calculated that 18 or 20 horsepower will be obtainable from the two-cycle competitors. The event will be watched with considerable interest, for should a two-cycle win, or even make a good showing, the popularity of this type of engine will be enormously advanced. Isotta-Fraschini, the first official entrants in the Voiturette Grand Prix, announce that their cars will have four-cylinder four-cycle engines of 2.4-inch bore.

Ford participation in the small Grand Prix race is under consideration, but has not yet been definitely decided upon. Henri Dépasse, who recently undertook the exclusive agency in France for the popular four-cylinder American runabout, declares that he would be glad to take part in the race if the rules allowed his 3.7 bore engine to compete. It is not likely that there will be any change in the rules of this or any of the succeeding voiturette races which would allow the Ford to compete, and the only possibility of making a demonstration against European cars would be by constructing special racers. One hundred millimeters bore for a single cylinder —equivalent to 3.9 inches—is considered the limit for a small runabout in France, and although nobody denies that the little Ford is a runabout, it is not allowed to line up with its smaller European rivals under present rules.

Victor Breyer, who last year so ably managed the French Grand Prix that the Racing Board found itself with a large balance in hand at the end of the race, has been succeeded by Georges Desson, the organizer of the Gordon Bennett race of 1905 and other sporting events of lesser importance. The change of management is not due to any dissatisfaction with the work of the previous délégué général, but has been prompted by a desire to give other favorites a share in the work. Under the new régime, which aims at making a financial success of the Grand Prix, the general manager will have a more difficult task on the popular circuit likely to be adopted than in distant and wild Auvergne.

Dieppe offers $10,000 and a remade set of roads to have the race in its district. The amount is only half that of last year, but the Dieppe authorities refuse to hand out another cent. Probably the Racing Board would accept their offer if the land adjoining the course had not gone up enormously in value. It would have been cheaper for the club to have bought it outright a year ago than to pay the price that is now being asked for three or four days' rent. Owing to this, other districts are being examined.

Maurice Farman, brother of Henry Farman, of aeronautical fame, has been selected to drive one of the Panhard racers in the Grand Prix. His companions will be George Heath and Cissac, the well-known motorcyclist.

Discussion has been aroused by S. F. Edge's attack on the Grand Prix rule forbidding the changing of wheels. England's greatest publicity expert declares that though he has three six-cylinder cars ready for the Grand Prix he will not enter them as long as the rule against changing of wheels remains in force. Dismountable rims are allowed under the racing rules, but dismountable wheels are forbidden. As it is this latter type that Edge has always employed on his racers at Brooklands track, he sees in the rules of the French club an attack on the British industry, and strikes back with all the vigor of his vigorous pen. Refusing to enter the road race without his own type of dismountable wire wheel, he challenges Réné de Knyff, of the Panhard firm, to a special track race, and has deposited $1,250 stakes with the Brooklands club for such an event.

RHODE ISLAND LAW HAS MANY FEATURES.

PROVIDENCE, Feb. 3.—The new automobile law about to be presented to the General Assembly is unique in that it has the practically unanimous support of the people of the entire State. It is the work of the special legal committee of the Rhode Island Automobile Club, consisting of Dr. Julian A. Chase, Col. Frank W. Tillinghast and J. Jerome Hahn, and contains a number of new features.

The penalties have been made severe, ranging from a fine of $10 to $500, or imprisonment from 10 days to one year, or both, for the violation of any of the provisions of the bill. It is also made an offence for the driver of a car to leave the scene of an accident in which he was concerned without giving his name and address to some person connected with the person or property injured or damaged. When left standing all cars must be so locked as not to be operated by any unauthorized person. All money received from fees is to go to the support or improvement of the roads, the charge being $2 for registration and the same amount for drivers' licenses.

Section 10 of the new bill is a reciprocal provision aimed at those States which do not permit the driving of a car on their roads by a non-resident without taking out a license, and provides that only non-residents of States that recognize Rhode Island licenses shall be immune from the operation of the new law for a period corresponding to that allowed to outsiders by their home States.

BAY STATE AUTOISTS OFFER REWARDS.

BOSTON, Feb. 3.—Never have local automobilists been aroused over the wrongdoing of one of their own fraternity as they are at present on account of the action of a driver in running away after striking a little girl in the town of Milton, one of the suburbs of Boston. According to witnesses the accident was unavoidable, but the driver, after carrying her to the door of her home, drove away witnout revealing his identity. As soon as the circumstances became known the Bay State Automobile Association offered a reward of $50 for the conviction of the party responsible. The Automobile Owners' Association has added $100 more and Frank J. Tyler of the Maxwell-Briscoe Boston company offered an additional $50. Then Charles S. Henshaw of the Haynes company offered $25 and the Safe Roads Automobile Association announced that its standing reward in such cases is $50. Thus the aggregate reward now amounts to $275. This case will undoubtedly do much to aid in the passage of a bill now before the Legislature designed to cover just such accidents. At present even if the responsible autoist or autoists are caught, it is doubtful if they could be successfully prosecuted, and there is no penalty for running away, except possible revocation of the license. The bill referred to makes running away after an accident punishable the same as reckless driving or operating while under the influence of intoxicating liquor, the punishment for which is a fine not exceeding $100 or imprisonment for not more than six months.

AUTOING THROUGH THE ISLAND OF SUGAR.

(*Continued from page 170.*)

of way goes up and down over clay banks and is thickly covered with rank grass concealing all kinds of stones, bumps and hollows. Then imagine a motor trip over it and you will have a fair idea of the best road we struck for many a toilsome league. A league, by the way, is the universal standard of measure in Cuba, and it means nothing in the mind of the man who tries to tell you how far it is to somewhere. The average country Cuban has never been further than a few miles from his own home.

We managed to get away off the route, and miss the towns we expected and find others we did not want. Toward the close of the afternoon we learned that we were cutting across fields and over unused trails and along forgotten highways to Esperanza, so we knew that we would then be on the way to Santa Clara. The rivers were close together. We forded nine that day, including some where the climbs up the far bank were so steep that if named in grade per cent. would not be believed.

We Slip Into a Bog.

Nightfall caught us in the one-too-many bog—a wide one into which we had slipped off the edge of a ridge. The car sank to its axles. Luckily we were in a region of stone fences. Jacking up one wheel at a time with stone fulcrums and saplings for levers, we built a rock foundation under each. Some Cuban farmers came along and helped us. Under the leadership of a lean, wiry individual they hustled with amazing energy. Through the night rang the quick:

"Espere un poco!" and the commanding "A un tiempo!" directing the movements of the men on the ends of the levers. When the car had a foothold, the motor was started, and, with a great upheaval of rock and mud, jumped to the hard ground, the interested natives let out a loud yell of approval and the wiry one shouted:

"El Toro! El Toro!" Thus the car got its nick-name.

Some more smaller mud holes, then a hill hewn roughly out of the native rock, and climbed slowly to the dark, and we drove into Santa Clara, proudly directed to the hotel by one of the Cubans who had come along as guide. He was soon the center of an eager crowd and probably told fearful and wonderful tales of this automobile in which he, among all Cubans of the province, had been the one to ride.

Rest of Tour in the Rain.

The rest of the tour was in the rain. Roads which had been fairly good when dry turned to slippery rinks of red mud. Ruts which could be ridden on the ridges during dry weather could be taken only by the most careful driving and arduous road picking. Ravines were so slippery that it seemed worse than foolhardy to try to either ascend or descend. Rivers rose. Bogs and swamps were turned into streams of soft mud. At each one we had to stop to find out if the bottom were hard or soft. We had profited by experience. A hard bottom one we took by "shooting it," a process which explains itself. The deep, wide, treacherous swamps we bridged with rough corduroy roads of palm trunks and underbrush. It was hard work. We forded three mountain rivers, for now we were in the Santa Fé mountains and were glad when, at the top of the struggling ascent up the rain-washed pass, we found a shelter and something to eat in a little grocery annex to the home of a farmer. Waldon bunked on a bench, with the seat cushions for mattress and fleas for company. The rest were on cots or in hammocks. The night was cold. We were stiff in the morning when we looked out on another day of rain and a perspective of mountain ridges, gullies, rivers and lowland sloughs. Until noon we worked getting over the three miles to Camajuani. This meant two rivers, hills and innumerable swamps. The engineering department, armed with axe, shovel and mattock, worked ahead and every inch of the way we repeated the cablegram we had received at Santa Clara from the general manager: "Have a good time."

The rest of the day was a continuance of the same thing and we made one less mile than the day before—thirteen instead of fourteen. At night we were still "shooting," dodging or fighting through mud holes and quit the day's work at a sugar plantation. We had supper in the laborers' eating house and slept on the same table. We dried our clothes over the kitchen fire, and laughed at each other and recited our experiences of the day.

We hit Placetas early the next morning, and found that we had made a needless trip through the Santa Fé mountains. We should have cut straight across from Santa Clara and left Camajuani and Camajuani river peacefully unaware of our existence. So we promptly left Placetas by the wrong road and at noon discovered we had made a goodly number of hard-earned, rain-soaked miles back towards Santa Clara. Twenty-seven miles altogether brought us to a tobacco plantation, and we were taken in.

That was a wonderful supper—the best we had had. Potage of beans, other vegetables and meat; fish, guinea, rice, fried potatoes—we were hungry and we ate voraciously under the eyes of senor, senora, senorita, and the children who were under the clothes age limit. Then we discussed ourselves and marveled at the racking we had given "El Toro," marveled at the way the tire casings had stood the abuse on the rocks, marveled at the feats of rough and ready road engineering and motor car driving which had been performed. Meanwhile senora slung hammocks for us, and when we went to them, lo, they were in a thatch-roofed pig pen! So we counted the eight pigs in the glare of a side lamp and chanted the glad refrain of that cablegram:

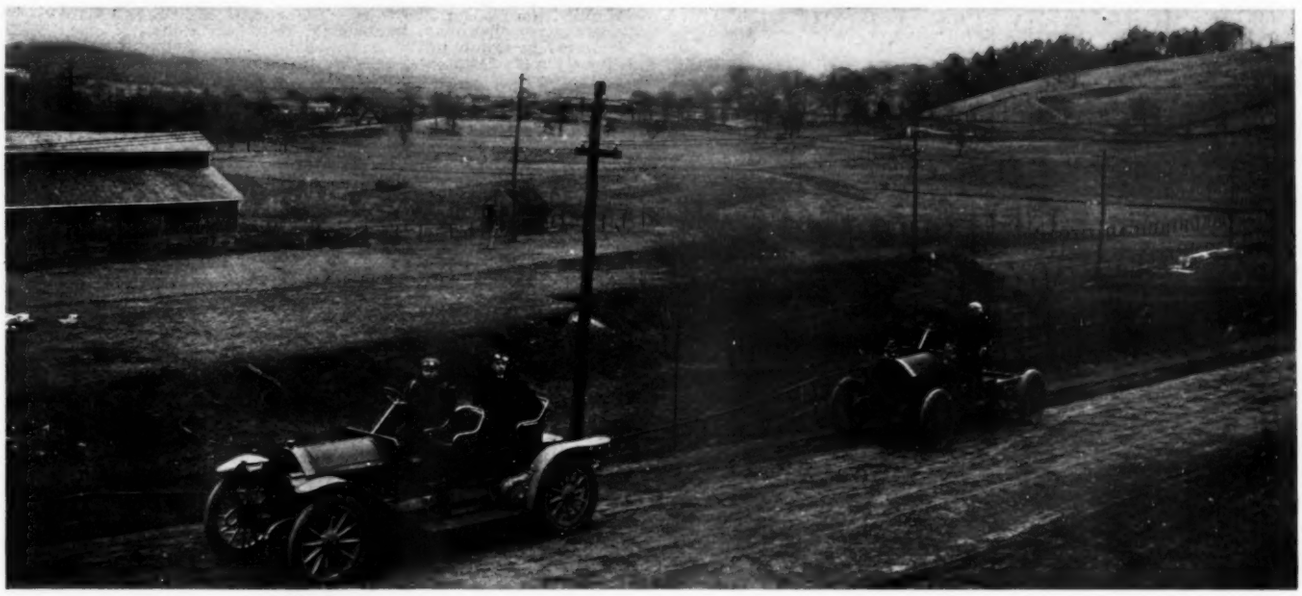
"Have a good time!"

Country Soaked to the Marrow.

The last day—if we could make the 28 miles to Sancti Spiritus in one stretch of daylight. Ahead we could always see the mighty Tuerto, flanked by Cabellete de Casa and La Gloria. The whole country was soaked to the marrow. The farmers told us that this rain was a delayed wet season. It seemed to us to be the real article. With the tonneau a mud-soaked mess of road tools, canned food, grips and blankets; with all but the driver on the running boards when we were not all out in the road shoveling, carrying stones or prospecting, we worked by right road and wrong road toward the town Guayos, where we debated whether we should stay for the night or take a chance of finishing it up rain or shine, muddy or dry, hills and rivers be d——d. A Cuban rural guard said that just over the next hill started a good road stretching to Sancti Spiritus. That next hill was like to-morrow, which never comes. Up one steep ascent of yellow clay, running with water, and so slippery that even the few sure-footed Cuban ponies which we met slid, sprawled and fell; down again and up, always looking for that promised road "over the next hill." We found it just outside of Sancti Spiritus, and the whole population of that city is still telling of how they flocked into the narrow streets to see the arrival of the automobile.

There is more to tell—the little things which were big at the time; the funny things and the hardships; the people, their homes, their country and their ways; the experiences in the towns and the disappointments in the country. There was so much to tell that each new hour's experience drove almost from mind that of the previous hour. One thing we had always in mind. We had done what we had been told could not be done; we had traveled where no other four-wheeled vehicle had ever traveled; we had conquered in our Packard "Thirty" the alleged impassable obstructions of the wild interior of Cuba—we had made good and did not care a rap that we had no clean clothes in which to appear before the elite of Sancti Spiritus.

E. R. S.



JOE TRACY, WITH A SIMPLEX, INVESTIGATING THE BRIARCLIFF COURSE, WHICH HE SAYS WILL TEST A CAR'S DURABILITY.

BRIARCLIFF ENTRIES NOW NUMBER NINETEEN.

Entries for the Briarcliff Trophy race are closed—officially at any rate. Whether others will be allowed to come in after the door has been reluctantly locked and barred is difficult to determine. "We have $9,500 in the bank," declared Thomas Francis Moore, secretary of the race. As each car must pay $500 entrance fee on account, a little mental arithmetic brings the number of engagements to 19. To assure success and safety it had been determined to limit the entries to 30, but in view of the shortage a different problem presents itself. Says Manager Moore: "The Manufacturers' Association has decided to accept additional entries at an increasing fee each week until the total is made up. They also gave Robert Lee Morrell power to act as he thought best, and his opinion is that no more entries should be received, in justice to those already engaged."

Chairman Robert Lee Morrell, interviewed on the situation, said: "The entry lists are closed; but if anybody else wants to come in, let him send his application along and it will be considered by the present contestants."

The list of entries as given out is as follows:

H.P.	Car.	Owner.	Driver.
30.	Hol-Tan	C. H. Tangeman	Basle
30.	Stearns	H. W. Whipple	Oldfield
30.	Stearns	F. B. Stearns	Leland
30.	Stearns	Wyckoff, Church & Partridge	Vaughan
50.	Simplex	Palmer & Singer	Tracy
35.	Allen-Kingston	A. Hammerstein	Campbell
50.	Lozier	H. A. Lozier	Michener
50.	Lozier	H. A. Lozier	Mulford
60.	Thomas Flyer	S. A. Houpt	Roberts
50.	Apperson	S. B. Bowman	——
50.	Isotta-Fraschini	C. Hamilton	Poole
50.	Isotta-Fraschini	C. Hamilton	Harding
50.	Isotta-Fraschini	J. H. Tyson	Strang
30.	Fiat	E. R. Hollander	Cedrino
30.	Fiat	E. R. Hollander	Ryall
30.	Renault	Paul Lacroix	Bernin
50.	Panhard	A. Massenat	Robertson
50.	Panhard	A. Massenat	——
35.	Maja	J. J. Brown	Murphy

No Locomobile in Briarcliff Event.

BRIDGEPORT, CONN., Feb. 3.—In spite of current reports to the contrary, the Locomobile Company announces that it has not planned to enter a car in the Briarcliff trophy race to be held in Westchester in April next. This decision is not based on any unfavorable attitude toward the event, but coming as it does when the entire factory force is engaged in turning out cars, the makers do not wish to have the daily routine of their operations seriously disturbed at such a critical season.

SAVANNAH MEET PROMISES GREAT SUCCESS.

Three Appersons, one Premier, and two Isotta-Fraschini cars are now entered for the road races to be held on the Savannah course, March 18 and 19, under the auspices of the Savannah Automobile Club and the A. A. A. Harding and Poole will probably handle the Isotta cars, and George Robertson and H. H. Van Tine will be given charge of the two Apperson "Jackrabbits." From inquiries made regarding the race, entries are likely to be large, and the enthusiastic co-operation of the district is already assured. Among those who have recently visited the course are representatives from Dragon, Stearns, and Mitchell, and Continental and Michelin tire factories.

According to reports from the Savannah Automobile Club, several hundred convicts, who are the roadmakers of the South, have been put to work on the course.

The Savannah Challenge Trophy, to be presented to the winner of the 360 miles stock chassis race, will be a life-sized bust of Tomachichi, chief of the Yumacrew tribe of Indians, and a personal friend of General Oglethorpe, founder of the city of Savannah. A roughly carved granite monument to Chief Tomachichi occupies a position in one of the public squares of Savannah, and it is a reproduction of this in silver which is intended. The war bonnet, which is a string of feathers, is so arranged that extra feathers can be inserted in it. As the trophy must be won three times before becoming the property of any manufacturer, each winner will receive a silver feather with particulars of the victory engraved upon it, and a duplicate feather will be put in the head gear of the chief. The Southern Runabout Cup and the Southern Six-cylinder Cup will become the property of the winners.

NINE MORE DAYS FOR ORMOND ENTRIES.

Nine days remain in which entries for the Ormond-Daytona beach races may be made to the Automobile Club of America. W. Gould Brokaw has put in the Christie front-drive racer; the Fiat Cyclone, a recent arrival from the Italian factory, has been entered, and Haynes and Renault have each engaged a racer, the French car to be handled by Bernin. The Maxwell twelve-cylinder racer is considered a possible starter. The race for the Dewar Trophy has been removed, and a one-mile straightaway substituted, the qualifying long-distance clause being retained. David Bruce Brown has entered in the amateur event.

RHODE ISLAND HAS A FINE SHOW.

PROVIDENCE, R. I., Feb. 3.—Over a hundred automobiles with their highly polished metal trimmings and many colored enameled bodies reflected the rays of a thousand lights in the new State Armory when the first Providence show was thrown open to the public last Saturday night. The weather conditions on the opening night were wretched, but in spite of the elements several thousand persons filled every aisle and thronged through the spaces reserved for the exhibitors, admiring the rich displays and tasteful decoration scheme which gave them a perfect setting.

The mammoth auditorium, or drill hall, of the armory, large enough to provide room for an entire regiment to be drawn up in order, is divided into three main aisles running the length of the hall, while other broad avenues cross the exhibition room at each end. All of the floor, excepting that portion taken up by the aisles, has been covered with green carpet bordered with dark red, while the exhibition spaces are defined by strips of dark red, which adds a touch of color to the floor decorative scheme. Tall slender palms mark the corners of the several spaces, while overhead are hangings of green and red burlap, forming a frame to mark the boundaries of the stalls. Huge American flags are suspended from the lofty girders, while flags of all nations are tastefully draped beneath. Both balconies have buff and blue striped bunting hung from the railing, while in the background are huge paintings and the national colors.

The automobile show affords the people of Rhode Island the first opportunity to view the interior of the State's newest public building, and the great auditorium, 270 feet long and 170 feet wide, has been transformed into a fairyland such as has never before been seen in the State.

Models of the foremost makes of automobiles are on exhibition, the total number being 120 separate cars, with over 40 concerns represented. Herewith is the car list:

American Locomotive Car (Berliet): American Locomotive Automobile Company
American: W. A. Fredericks Company
Atlas: Crane Automobile & Garage Company
Buick: Davis Automobile Company
Cadillac: Davis Automobile Company
Corbin: Arthur S. Lee
Elmore: Pugh Bros.
Ford: Providence Motor Car Company
Franklin: Dauer Automobile Company
Glide: Crown Motor Car Company, Boston
Grout: Aetna Bottle & Stopper Company
Jackson: C. M. Linton
Kiblinger: Crown Motor Car Company, Boston
Knox: Foss-Hughes Motor Car Company
Locomobile: Davis Automobile Company
Marion: W. A. Fredericks Company
Marmon: Frank E. Wing, Boston, Mass.
Maxwell: Aetna Bottle & Stopper Company
Mitchell: William A. Harris Steam Engine Company
Northern: Edgewood Automobile Company
Oldsmobile: Davis Automobile Company
Overland: W. A. Fredericks Company
Packard: Flint Motor Car Company
Peerless: Davis Automobile Company
Pierce-Arrow: Foss-Hughes Motor Car Company
Premier: J. O'Donnell
Rambler: Whitten Motor Vehicle Company
Reo: William Hughes Company
Royal-Tourist: Arthur S. Lee
Stanley: Central Automobile Exchange
Stevens-Duryea: Snow Automobile Company
Stoddard-Dayton: Nock Automobile Company
Studebaker: Pawtucket Automobile Company
Thomas: Davis Automobile Company
Welch: C. M. Linton
White: Central Automobile Exchange
Winton: Davis Automobile Company

COMMERCIAL TRUCKS.

American Locomotive Automobile Company
Foss-Hughes Company

The accessory list is lengthy and as follows:

The Villers Company.....Optical supplies
Thompson Art Company, Portland, Me.....
Belcher & Loomis Hardware Company.....Marine supplies
The Angier Company.....Accessories
Aspinwall Hardware Company.....Marine supplies
William A. Harris Steam Engine Company...Engines
Waite Auto Supply Company.....Accessories
A. W. Harris Oil Company.....Oils
Blanding & Blanding.....Cigars
John A. Gammons.....Automobile insurance
Nonpareil Brass Company.....Accessories
Visor Knitting Company, Niagara Falls, N. Y. Caps
Combination Ladder Company, ...Chemical engines and accessories
J. B. Draper Company, Brunswick, Me.....Robes
Vacuum Oil Company.....Mobiloils
Eutaw Supply Company, Boston, Mass.....Accessories
W. R. Harris.....Marine engines
Century Optical Company, New York.....Optical supplies
B. A. Swenson.....Motorcycles
L. F. Pease Company.....Tents
Ira N. Peck.....Ball bearing tires
Providence Telephone Company
Welch Grape Juice Company
Spare Wheel Company, Ltd.
Mianus Motor Works
Modox Company
W. R. Richards
Motor Car Specialty
Atlantic Boat Company
New England Automobile Journ.
Providence Tribune

CENTRIFUGAL PRINCIPLE OF THE VEEDER.

Editor THE AUTOMOBILE:

In your issue of January 30 we notice that you have given publicity to an article concerning speed indicators of centrifugal types.

The Veeder Manufacturing Company manufactures a speed indicator called the Veeder Tachodometer, which depends on the centrifugal principle, but not on the position of a revolving weight. It is well known to anyone who has investigated the matter, that a speed indicator built by having for the moving force weights which take different positions according to the centrifugal force developed by the speed of the instrument, will, by the nature of the instrument itself, give more movement for a low speed than for a high speed. This is corrected in almost all these instruments by a cam.

The Veeder Tachodometer does not use any cam to adjust the graduations on the scale so as to make them even. On the contrary, the graduations are closer at the low speeds than at the high speed. This is a very desirable item, as it renders the instrument much more easy to read at a high speed than at a low speed, and it is when running at a high speed that one needs to read the instrument at a glance. If the graduations are all even, they are no more easily read when one is going 60 miles an hour than when one is going 10 miles an hour. A car running at 60 miles an hour, however, requires nearly all of the attention of the driver, and he should not be compelled to spend much time to determine his exact speed. For this reason the Veeder Tachodometer is very much more desirable as a speed indicator than any instrument having an evenly graduated scale, and exceedingly more desirable than an instrument which has closer graduations for the high speeds.

It is not claimed that the Veeder Tachodometer is absolutely accurate. Such a claim is on the face of it absurd. It is claimed, however, that this instrument is accurate within an error of one per cent. There are no parts of the instrument subject to wear, which would tend to make it inaccurate after a period of use. It has ball bearings throughout, and the only part which moves is the paddle which imparts motion to the liquid in the instrument. For this reason the instrument might be used for ten years and at the end of that time show no greater inaccuracy than when it was first made. This could not be true of any purely mechanical instrument, because the wear on such an instrument does cause an appreciable increase in the error.

Any instrument in which a cam is used wears out of accuracy more rapidly than if the wear were simply on the bearings. A cam will always wear in spots, either because of inequalities of the structure of the material of which it is made, or because of inequalities in the forces which act upon it at different times. These objections have been overcome in the Veeder instrument, and for this reason it is by all odds the most accurate and reliable instrument for speed indicating now on the market.

THE VEEDER MANUFACTURING COMPANY,
Hartford, Conn. A. Trowbridge.

PLACE TO CARRY LIGHTS; HOW TO TRUE THEM.

Editor THE AUTOMOBILE:

Replying to your letter (1,143) as regards the "Position of Automobile Headlights," the writer has experimented as to the best place to carry the gas headlights, and, after trying all positions, we have found that where they are now put is, everything considered, the proper place.

The fault your correspondent speaks of, that is, of magnifying small inequalities, is caused by the rays from his lamp striking the ground at too much of an angle, and if he will tilt his lamp upward this defect will disappear.

The idea of placing lamps on the fender is all right, provided the lamp is placed so that the rays do not strike the fender. If they do, one will have a nice large shadow reproduction of the fender, that is anything but a help.

Manufacturers and users are not at all careful about "truing" up lamp brackets. We have noticed a great many cars driven by men who ought to know better, with headlights pointing anywhere than where they should. The proper way to "true up" headlights is to drive to within 25 feet of a blank wall and then adjust lamp brackets so that the lamps will throw the rays straight ahead.

Amesbury, Mass. GRAY & DAVIS.

H. A. KNOX TALKS TO A. C. A. ON TWO-CYCLE.

At the Automobile Club of America on Tuesday evening last, Harry A. Knox, president of the Atlas Motor Car Company, of Springfield, Mass., delivered a lecture on the subject of the two-cycle motor and its possibilities on the automobile, particularly with reference to the Atlas motor which his company builds, and which has proved very successful. In the gathering were many of the pioneer members of the club who, in the past seven or eight years, have had experience with almost every type of automobile built, so that when President Colgate Hoyt introduced Mr. Knox, he found an attentive and well-informed circle of listeners. The lecture was more in the nature of an informal talk than a set technical paper on the subject of the two-cycle motor, and Mr. Knox illustrated his points with the aid of the component parts of one cylinder of an Atlas motor.

Mr. Knox concisely pointed out the advantages and disadvantages of the two and four-cycle types by impartially comparing them, and showing that while the former had not, up to recently, rewarded the efforts of investigators as they had anticipated, this did not affect the possibilities of the two-cycle motor, and that it only required the proper application of its principles to reap the numerous benefits of simplicity and efficiency which this type held out. Numerous questions were asked of the lecturer, which led to a very interesting discussion.

OLSMOBILE "MUDLARK" PLUGGING SOUTHWARD.

COLUMBUS, O., Jan. 31.—Ralph Owen, who is driving his 40-horsepower Oldsmobile *Mudlark* on the 2,000-mile midwinter trip from New York to New Orleans, arrived here to-night covered with mud from tires to top. Owen reports the roads from Buffalo to Cleveland to have been almost impassable owing to snow banks and ice driven into the roadway from the frozen surface of Lake Erie. This is the first automobile to attempt the trip to New Orleans from any of the Northern cities.

Owen left last Sunday, and expects to arrive in New Orleans February 14. If the schedule which he has been able to maintain up to date is approximated from now on he will be able to finish the 2,000 miles by that date. The *Mudlark* is fitted with Diamond tires.

AN ANTI-AUTO RACING N. Y. ASSEMBLYMAN.

ALBANY, N. Y., Feb. 5.—Assemblyman Yale, of Putnam County, to-day introduced a bill repealing sub-division 6, article III, of the present motor vehicle law, which provides that "local authorities may, notwithstanding the other provisions of this act, set aside for a given time a specified portion of the highway for speed tests and races." Assemblyman Yale says State Engineer Skene favors the bill on the ground that racing automobiles tear up the good roads.

Assemblyman Fowler, of Ulster County, has introduced a bill providing for an annual registration fee, based on the weight of a motor vehicle, such rate to be 50 cents per 100 pounds.

TAXICAB SERVICE FOR THE CAPITOL CITY.

WASHINGTON, D. C., Feb. 2.—Application has been made to the District Commissioners by the Thomas Taxicab Company for a license to operate a system of taximeter automobile cabs in this city. Robert A. Parke, who represented the E. R. Thomas Motor Company, of Buffalo, N. Y., is spending several days in Washington, in order to formulate plans for the proposed service, and it is expected E. R. Thomas will be here during the week to assist in the work. The system will be put into operation about March 1, if the company meets with no opposition.

LONG ISLANDERS TO HOLD ECONOMY RUN.

BROOKLYN, Feb. 4.—A one-day midwinter economy test from Brooklyn to Montauk and return will be held by the Long Island Automobile Club on Tuesday, February 25. Gasoline and lubricating oil will be supplied in sealed cans to each contestant at a price basis of 25 cents per gallon for the former and $1 for the latter. The winner will be the car which carries its full quota of passengers and official observer over the 242 miles at the lowest cost for each person, fuel and oil only to be considered. A comparison with railroad rates will be made. There will be no penalties for repairs or adjustments on cars or tires, but contestants must conform to a time limit to be determined the night before according to road conditions. Entry fee is $25 for the first, $15 for the second, and $10 for the third car, entries closing on February 20, or at 6 P. M. on February 24, on payment of a penalty of $10. The club reserves the right to abandon the contest if at least 25 entries have not been received at the regular time of closing, or to postpone the run if snow on the road should made them impassable. Final instructions will be given at a meeting of contestants and officials at the L. I. A. C. clubhouse. Cars may be left in the garage all night if desired. The contest committee consists of Arthur R. Pardington, chairman; C. G. Arnold, and F. D. Bandell. Russell A. Field, the club secretary, announces that the entry blanks will be published immediately, and can be obtained at club headquarters, 360 Cumberland street, Brooklyn, or will be mailed to intending entrants upon request.

C. L. GOODHUE NOW HEADS KNOX COMPANY.

SPRINGFIELD, MASS., Feb. 3.—The long-anticipated reorganization of the Knox Automobile Company, of this city, which made a voluntary assignment for the benefit of its creditors in July, 1907, was effected at a meeting of the directors on February 1. As a result Charles L. Goodhue was elected president, succeeding E. H. Cutler, while William E. Wright was reelected vice-president. Mr. Goodhue was also elected treasurer of the company, succeeding Albert E. Smith, who resigned from the directorate, together with E. H. Cutler, H. F. Farr and G. W. Bennett. The new directors are Charles H. Beckwith, Alfred N. Mayor, Charles L. Goodhue, Peter Murray and William E. Wright, Springfield; Clarence E. Whitney, Hartford; W. H. Chase, Leominster; M. J. Greenwood, Gardner, and H. W. Cutler, North Wilbraham.

The company's assignment was brought about by a lack of capital and the pressing need for ready money at the time, and the plan for reorganization includes the issuance of $500,000 in preferred stock to the creditors of the company, which is practically a capitalization of the concern's indebtedness. Conforming to this plan, the management has been handed over to the preferred stockholders, or, in other words, the creditors, which accounts for the numerous changes in the officers and directorate. Alfred N. Mayo has acted as trustee for the company since the assignment, and there has been a considerable increase in its sales during the interim, so that a larger business than ever is confidently anticipated during the coming year, now that the temporary financial tangle has been settled to the satisfaction of all concerned.

MANAGER APPOINTED FOR AUTO CARNIVAL.

Thomas Francis Moore has been appointed manager of the automobile carnival which the New York Automobile Trade Association intends to hold during the week beginning April 6. The appointment was made at a recent meeting of the association at the Hotel Cumberland. Features of the carnival already decided upon are a parade on Tuesday, April 6, and various gymkhana games and contests.

FRANKLIN NON-STOP CAR ON A MARYLAND ROAD.

FRANKLIN MAKES A COLD-WEATHER RUN.

WASHINGTON, D. C., Feb. 3.—New honors have just been won by a Model Franklin in completing a 96-hour non-stop run, 500 miles of which was made on the road and the remaining 1,300 miles in the garage. At 11:34 o'clock, Tuesday morning, Jan. 28, the car left the city and covered the route of the recent sealed bonnet contest of the Automobile Club of Washington, which embraces 125 miles of road that is in very poor shape when the weather is bad. At the conclusion of each day's run the car was placed in a glass case in the garage of the Cook & Stoddard Company, Franklin agents, and there were various shifts of observers to see that the engine was kept running. The car was piloted alternately by J. H. Dailey, holder of the San Francisco-New York and Chicago-New York records, made in Franklin cars, and F. S. Bliven, of the Cook & Stoddard Co.

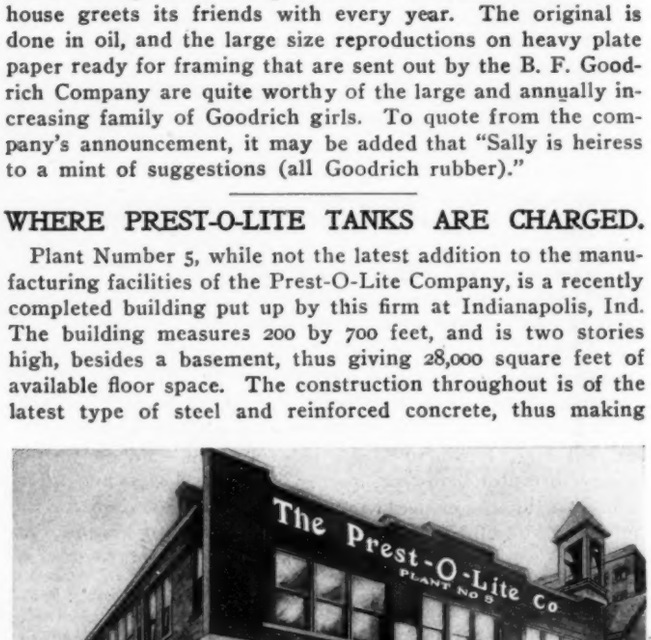
During the course of Friday's run Dailey was unfortunate to encounter a farmer riding a horse. The latter became scared at the car and proceeded to bolt. The car was stopped and Dailey tried to pacify the farmer. The latter insisted on his stopping the engine, but as this would defeat his project, Dailey declined to accede. A constable arrested the entire party and took them to Lima, Md., where a magistrate fined Dailey $47 and costs, but the latter telephoned the State's Attorney. He advised the magistrate that he had exceeded his rights and that the highest fine he could assess was $5 and costs. At the expiration of the ninety-sixth hour President Caverly of the Automobile Club of Washington formally brought the run to an end.

THE GOODRICH GIRL FOR 1908.

"Sally is an heiress," that is the Goodrich Sally, who is the charming feminine representative that the Akron rubber house greets its friends with every year. The original is done in oil, and the large size reproductions on heavy plate paper ready for framing that are sent out by the B. F. Goodrich Company are quite worthy of the large and annually increasing family of Goodrich girls. To quote from the company's announcement, it may be added that "Sally is heiress to a mint of suggestions (all Goodrich rubber)."

WHERE PREST-O-LITE TANKS ARE CHARGED.

Plant Number 5, while not the latest addition to the manufacturing facilities of the Prest-O-Lite Company, is a recently completed building put up by this firm at Indianapolis, Ind. The building measures 200 by 700 feet, and is two stories high, besides a basement, thus giving 28,000 square feet of available floor space. The construction throughout is of the latest type of steel and reinforced concrete, thus making

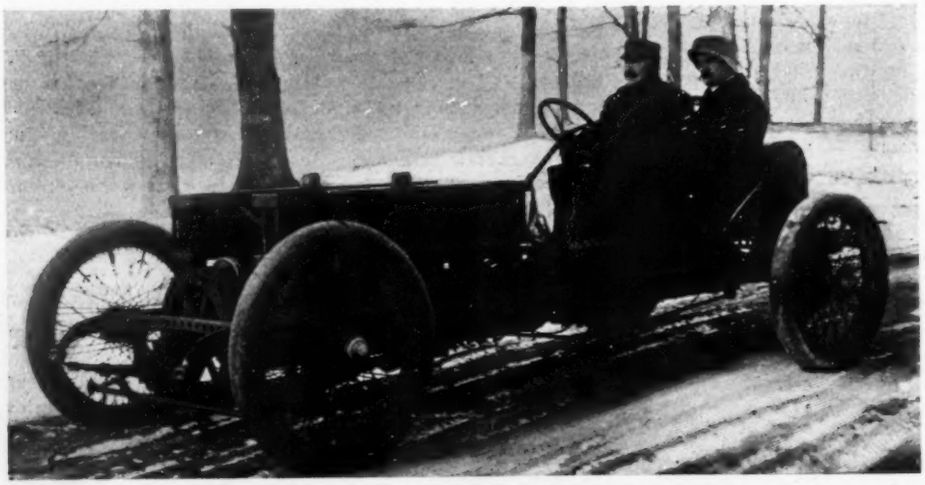


PREST-O-LITE FACTORY NO. 5, AT INDIANAPOLIS.

it absolutely fireproof. It has been in operation since the beginning of the year and is one of the largest of its kind in the country, having a capacity of 2,000 Prest-O-Lite acetyline gas cylinders daily.

TWELVE-CYLINDER MAXWELL AFTER FREAKS.

The twelve-cylinder 180-horsepower Maxwell racer is out for a special test of speed against all comers. The Sir Thomas Dewar trophy race would have given the opportunity desired, had that event been retained on the Ormond-Daytona program. This speed test having been withdrawn, the Maxwell-Briscoe people have written to Robert Lee Morrell, chairman of the contest committee of the A. C. A., asking him to issue a challenge on their behalf to the Stanley steamer or any other fast car, for a race to be held either during or immediately after the Florida beach tournament. It is declared that, with the consent of the trophy trustees, the twelve-cylinder Maxwell will be held in readiness at any time during the meet to start against all comers.



NEW 12-CYLINDER MAXWELL CHALLENGER WITH DESIGNER MAXWELL AT WHEEL.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Beck & Clausel, 204 Cox avenue, Memphis, Tenn., are about to put a new car on the market after designs of A. C. Menges, late of Grand Rapids, Mich., and though all details have not been definitely settled a four-cylinder car of medium price, high power and light weight will be made.

The Detroit branch of the G & J Tire Company will remove at once from 247 Jefferson avenue to 256 Jefferson avenue and occupy part of the Hartford Rubber Works Company branch store at that number. The individuality of the two concerns will, of course, be maintained, H. C. Severance continuing as manager of the Hartford Rubber Works Company and Charles S. Monson of the G & J Tire Company.

Holsman cars are not built primarily for speed, but that they can hold up their end in this respect when necessary is amply evidenced by the fast trip from Winslow, Neb., to Fremont, made by President Weitkamp of the Bank of Winslow recently. He left Winslow in his Holsman a few minutes after the departure of the regular train and succeeded in overtaking it, covering the distance of fourteen miles between the two towns in thirty-five minutes.

During the past week or so there has been a rumor abroad to the effect that the Hartford Rubber Works Company, Hartford, Conn., contemplated closing their branch houses in Buffalo and Cleveland, and in some instances the rumor had it that this was already an accomplised fact. The company makes haste to brand the report as entirely unfounded, and states that there is no intention of taking any such action, nor has the matter come up for consideration.

The C. A. Shaler Company, of Waupun, Wis., have just made shipment through C. B. Richard & Company, custom house brokers, 31-33 Broadway, New York City, of ten cases of their Shaler electric vulcanizers, which is the first of such shipments which are to be made monthly during 1908, to one of their largest foreign accounts, Armand Frey & Co., Behren Strasse 47, Berlin, Germany. This order for 120 cases is a direct result of the Madison Square Garden Show.

The Hess-Bright Manufacturing Company, of Philadelphia, has found it necessary to make a third change to larger quarters and will shortly occupy a four-story building, with a floor space of 15,000 square feet, exclusive of the basement, which is given up to a modern gas producer power plant. Aside from the DWF ball-bearing division, this is the largest plant devoted exclusively to the manufacture of ball-bearings of only one grade, that of the annular type. The new quarters will be occupied some time within the next six weeks.

When Nelson S. Riley, of New York, went to Honolulu last fall, he bought a new Studebaker "30" car from the Studebaker branch in San Francisco and took it with him to the islands. The machine attracted a good deal of attention in Hawaii, especially as it was the first car ever seen there employing the "make and break" system of ignition. Mr. Riley writes that the quiet running qualities of his car have been particularly commented upon and its noiselessness has earned for it the name of "the gliding car."

A preliminary injunction has been issued by the U. S. Circuit Court, Southern District of New York, against the Motor Car Equipment Company, of New York City, forbidding them to make or sell lamps in imitation of the Rushmore Flare Front searchlights and headlights; also to use the words "Flare Front" or the name Rushmore in describing their product. This injunction is in line with the one lately issued against the Manhattan Lamp Works. Actions will shortly be brought against a number of other concerns for injunctions and an accounting.

The Brush-Detroit Motor Company, 255 Jefferson avenue, Detroit, according to a letter just received by THE AUTOMOBILE, does not believe that the times are particularly hard. States Manager P. R. McKenney: "We are doing phenomenally well in our new quarters, having sold twelve cars in less than four weeks, some of these for immediate delivery and the balance for early spring delivery. We are still getting replies from our last advertisement in your publication, and they all seem to be good prospects." This company sells the Brush $500 runabout.

Further important additions are about to be made to the building and manufacturing equipment of the Rambler factory which has been for years one of the largest exclusive automobile plants in the world. Within the past two weeks six more acres of ground, adjacent to the factory in Kenosha, have been purchased by Thomas B. Jeffery & Company. The ground area now measures one-half mile from east to west and one-half mile from north to south. This factory has been in operation every single working day since 1900 and each year the capacity of the factory has been considerably increased.

"A car a day has been the record of the shipping room of the F. B. Stearns Company since early in December, and this pace bids fair to continue until the 1908 stock is exhausted," say the makers. "The market seems to be easing up steadily, and the prospects for a good selling season are better right now than they were at this time last year, which is saying a good deal. A visitor to the Stearns factory is more than impressed by the way work is being rushed, and the full night shift is still hard at it. Talk of the recent 'near-panic' has not affected this plant any more than scores of others turning out really high-grade machines."

The continental touring service which has been conducted by E. B. Gallaher, of 228 West Fifty-eighth street, New York City, has been transferred by arrangement to the Maja Company, Ltd., for which Mr. Gallaher is director and American manager. In addition to the branches maintained at Havre, Southampton, Liverpool, London, Stuttgart, Genoa, and Bremen, additional agencies will be opened in connection with the Maja branches at Hamburg, Paris, and St. Petersburg. The service inaugurated by Mr. Gallaher has been decidedly helpful in its work of furnishing information and service in the matters of shipping, repairs, licenses, regulations, road maps and many other details. Its effectiveness will be largely increased under the new arrangement and as the entire organization of the Maja Company, Ltd., will be available.

The selling force of the Meek Company, dealers in leather goods and advertising specialties, Coshocton, O., has been sent on an unusual continental automobile tour. The entire force was supposed to leave the factory on an imaginary tour to the Pacific Coast, following the general direction of the Northern Pacific Railroad, and returning by the route of the Southern Pacific. One hundred towns, which for convenience have been called 100 miles apart, have been placed on the route. Each man is supposed to have some well-known make of automobile, the progress of which is determined by amount of sales. A perfect day carries him 100 miles; a perfect week a further advance. The salesman to return to Coshocton first receives the most valuable prize. There are six lesser prizes.

NEW AGENCIES ESTABLISHED.

The American branch will open a Boston office and salesroom at 885 Boylston street, Boston, for the handling of Fiat cars. S. H. Baker will be in charge.

The Bartlett-Jacobs Company, No. 887 Boylston street, Boston, in addition to the Allen-Kingston agency, has added the Mercedes and De Dietrich cars for Boston and vicinity.

Joseph M. Gilbert, general manager of the Continental Caoutchouc Company, announces that two more distributing agencies have just been added to agency representation of his concern. They are the Long Island Auto Supply Company, 1249 Bedford avenue, Brooklyn, and the Acme Rubber Company, Toledo, O.

Renault branches on the Pacific Coast will in future be handled directly by the Renault Frères Selling Branch's own establishment at 316-322 Van Ness avenue, San Francisco. Paul Lacroix, general manager for the Renault in America, has just completed arrangements.

The Palmer & Singer Manufacturing Company, of New York City, have just added to their already very representative line of cars, the new Selden 28-horsepower car to sell at $2,000, which will give them one of the most complete price ranges that almost any agency house in the country can boast. They will control the Selden throughout Greater New York. Rose & Thompson, proprietors of the Yonkers Auto Station, will handle the Selden in that city. Mr. Rose was formerly associated with E. T. Birdsall, the designer of the Selden, in the old Decauville Company.

PERSONAL TRADE MENTION.

J. S. Draper, for the past three years sales-manager of the Wayne Automobile Company, Detroit, Mich., has just resigned that position to assume the duties of general sales-manager of the Mora Motor Car Company, of Newark, N. Y. Mr. Draper's resignation became effective on February 1.

Roy D. Chapin, treasurer and general manager of the E. R. Thomas Detroit Company, is now making a trip to the Pacific Coast in the interests of the latter. A considerable business in Thomas Detroit cars is done in the Far West and particularly on the coast, and as Mr. Chapin is well and favorably known there he is expected to make a very successful trip.

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